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USDA Foreign Agricultural Service

Afghanistan: Crop Progress Report

MY 2010/11

January Summary

January 29, 2009

- (1) The early outlook for Afghanistan's MY 2010/11 wheat crop is questionable, despite an extremely favorable autumn weather pattern and ideal early season moisture conditions. The key threat to the wheat crop at this early point is the low level of snow which has accumulated in the high mountain areas since December. Snowpack levels are currently well-below normal, implying that the nation's irrigated wheat crop may have much reduced water supplies this spring. Irrigated wheat acreage normally contributes 70 percent of Afghanistan's total annual wheat production, so any substantial decline in water availability would cripple production prospects this year. Weather conditions at the start of the current MY 2010/11 grains season in Afghanistan were extremely favorable for winter grain planting and early growth. This is apparent in current satellite measurements of crop conditions, with better than average crop vegetative development throughout most of Afghanistan. Particularly positive crop conditions are prevalent throughout the main northern rainfed and irrigated agricultural areas. In January, however, the weather pattern worsened, with significantly reduced rainfall and well-above normal temperatures prevailing throughout the country. This led to a net reduction in the snowpack, while also hastening crop growth. For the time being Afghanistan's wheat crop is progressing well, but should rainfall continue to be deficient in coming months, national production potential will diminish.
- (2) Cumulative rainfall was very favorable from September-December in most major grains producing regions (northwest, north and northeast), enabling farmers to plant their crops in a timely manner and for soils to build up modest amounts of stored moisture for seed germination and early growth. These unusually favorable rains created one of the best starts to the wheat growing season in many years. By mid-December, however, overall weather conditions began to deteriorate, with well-below normal precipitation occurring across the entire country (Figure 2). While very poor January rainfall will not have a direct effect on current wheat crop conditions, it has prevented the fresh accumulation of new snow in the mountains which may cause a decline in wheat production prospects in the spring. Temperatures have also been well-above average over the last 30 days, enhancing crop growth while also increasing snowmelt at lower elevations (Figure 3).
- (3) Satellite-derived vegetation index (NDVI) analysis comparing current crop conditions against the previous 6-year average and against last year indicate that excellent early season moisture had a very positive effect on the MY 2010/11 crop development (Figure 8). NDVI data show that the current wheat crop is better developed than both last year and the 6-year average in all major grain growing areas except the Eastern regions. Figures 9 through 24 show regional level NDVI analysis of current wheat crop conditions. It should be noted that

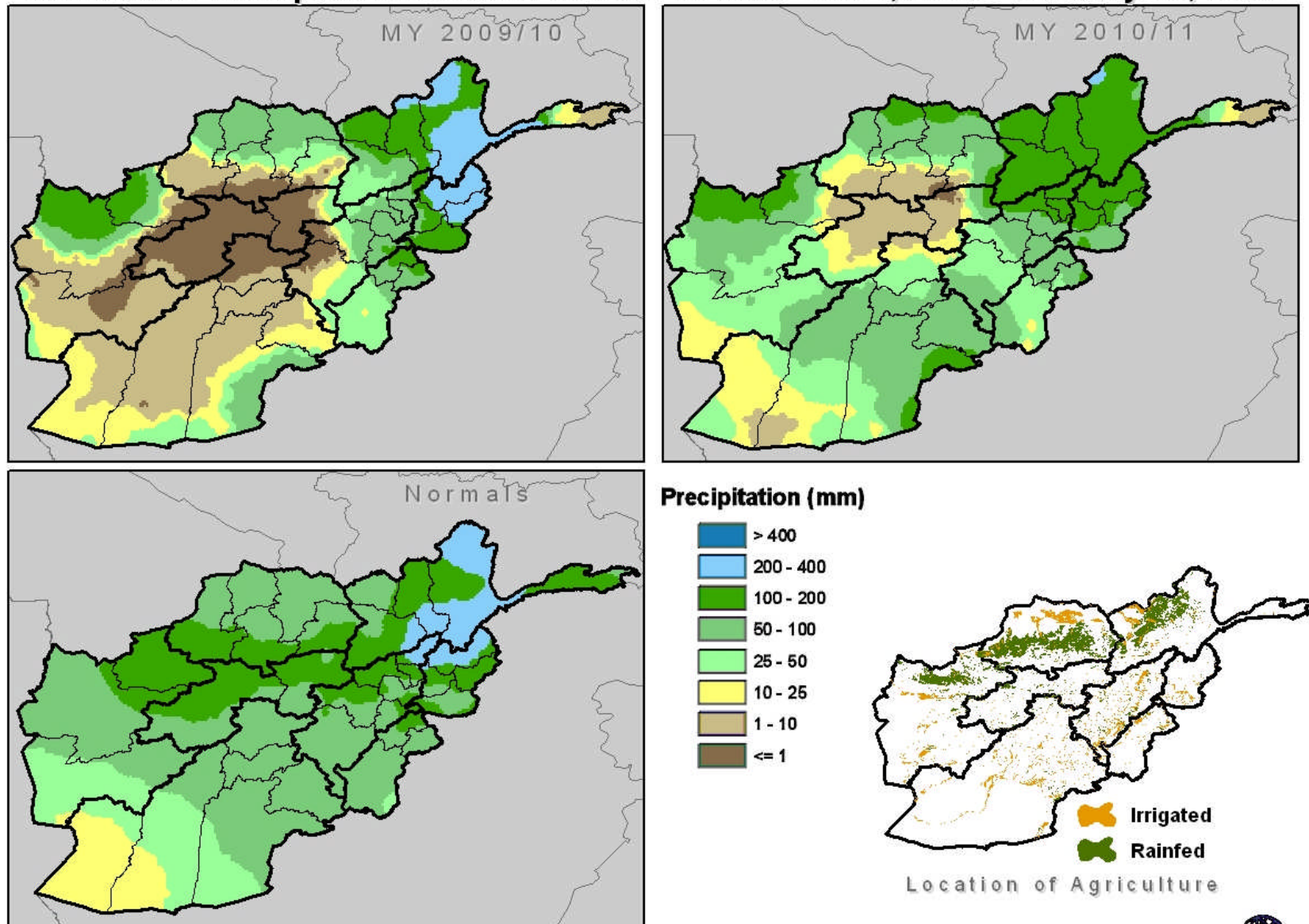
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last year Afghanistan achieved a record national wheat harvest, recording the highest production level in the past 50 years, as a result of both an increase in cultivated area and ample rainfall and irrigations supplies. Given the very strong development of the current crop, it is possible that Afghan farmers have increased acreage once again and that they may be using more fertilizer to boost crop yields this year. It is important to note, however, when analyzing NDVI data that it is still relatively early in the grain growing season, and current conditions are not strict indicators of actual crop output. The production outlook will be highly dependant on weather conditions and water availability further along in the season. The best evidence of crop production potential occurs during peak crop growth during the months of March and April (Figure 4).

- (4) An estimated 88% of irrigation water supply for crop production is derived from the surface water that flows through Afghanistan's river basins, and both surface and ground water recharge in the country is directly linked to spring snow melt out of the Hindu Kush Mountains. Water availability for crop production is a factor of both the amount available through snow melt (snow water equivalence) and the rate of snow melt. Snow accumulation through January, in both areal extent and depth, has been extremely low compared to previous years (Figure 28). When compared to last year and MY 2008/09 it is clear that current snow conditions are much below normal. It is uncertain whether or not the snowpack situation will improve in upcoming weeks, but peak accumulation usually occurs by early March (Figure 29). This would imply that Afghanistan only has about 4 weeks left to substantially increase its snowpack, before increasing seasonal temperatures initiate major snowmelt. Higher than average temperatures since late December combined with very low precipitation in January are responsible for the record low snow pack so far this season. The abnormally high January temperatures have actually caused a net loss of snow area over the past month (Figure 30).
- (5) The NOAA Climate Prediction Center's 7-day rainfall forecast indicates additional moderate precipitation will occur over the entirety of Afghanistan, with substantial accumulations occurring in the east and east central provinces. This precipitation could result in a favorable increase in the national snowpack (Figure 31).

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Cumulative Precipitation: Grains Season to date Oct. 1, 2009 - January 20, 2009



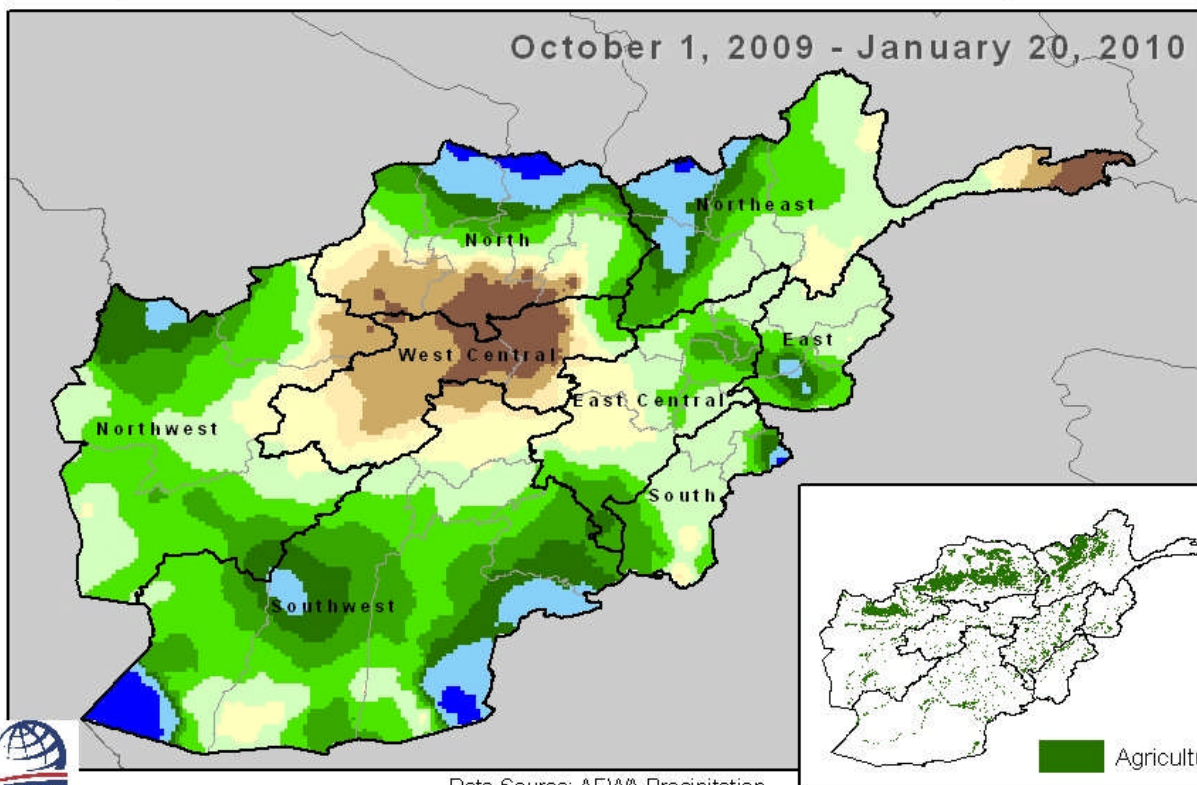
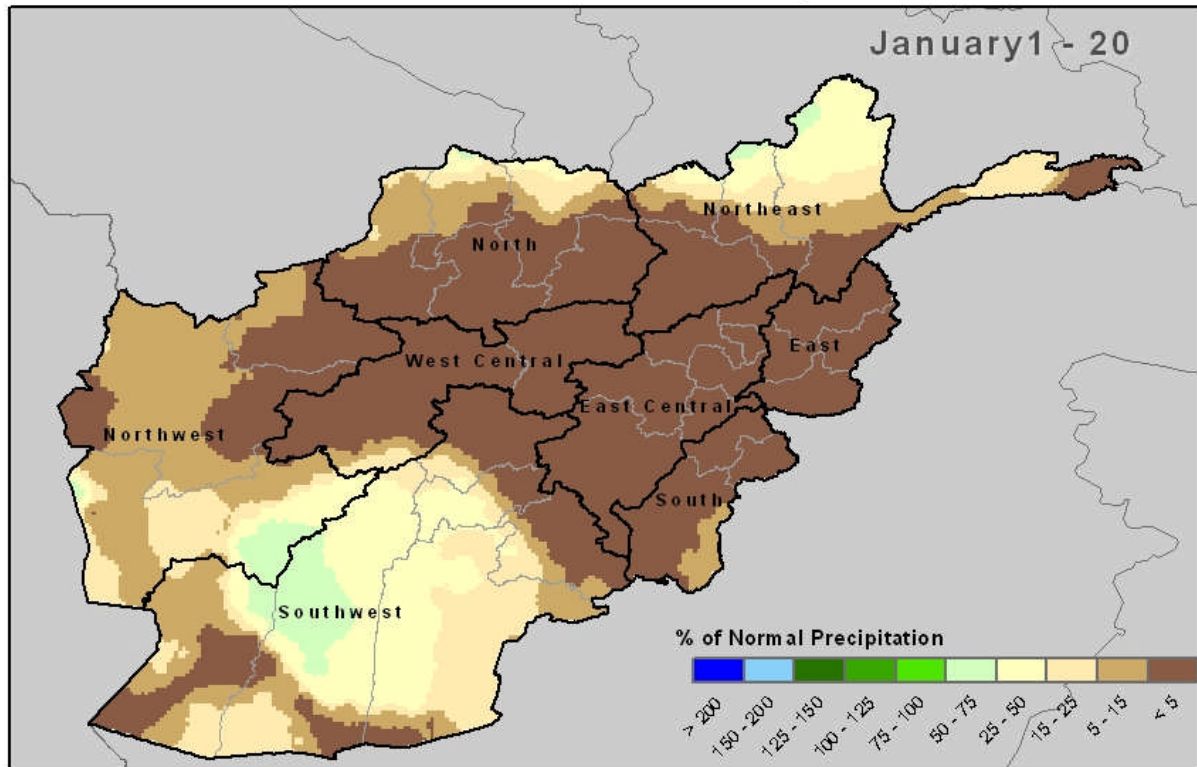
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Figure 1. Season to date cumulative precipitation showing current year (MY 2010/11) compared against the previous years and precipitation normals.

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Percent of Normal Precipitation



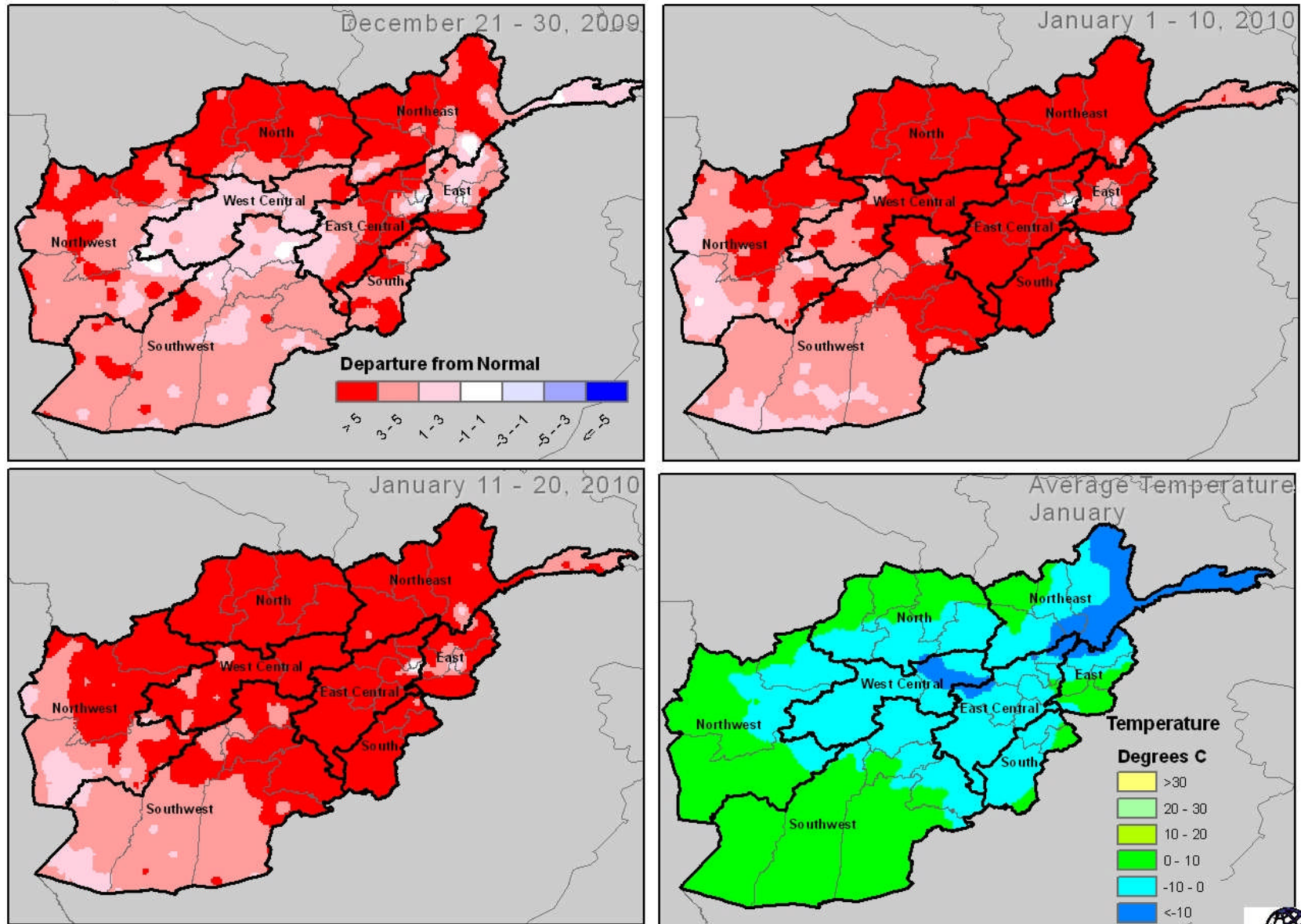
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Figure 2. Percent of normal precipitation showing the current month and winter grains season to date.

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Temperature Departure from Normal: Dec. 21, 2009 - Jan. 20, 2010



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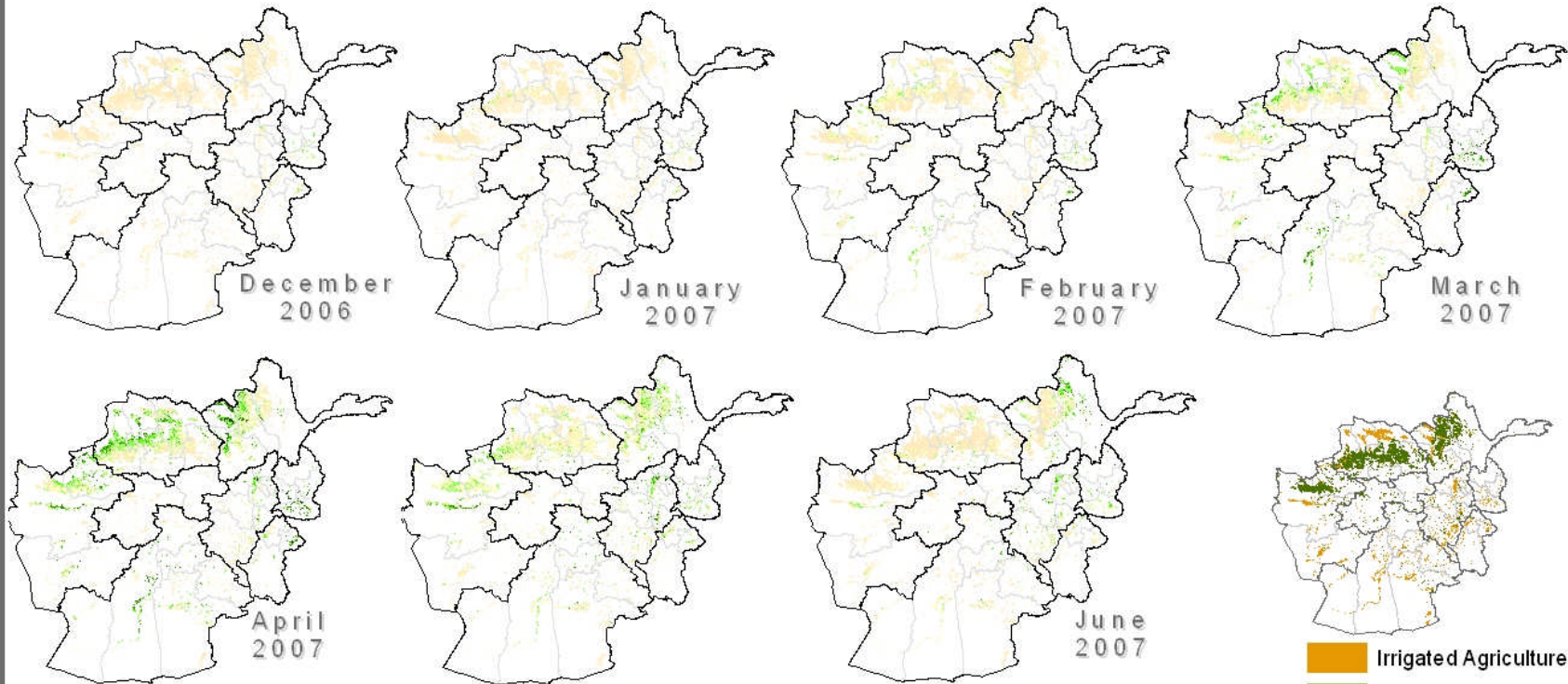
Figure 3. Decadal temperature departure from normal from December 20, 2009 to January 20, 2010

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MODIS NDVI Time Series: MY 2010/11 vs. MY 2007/08 Benchmark

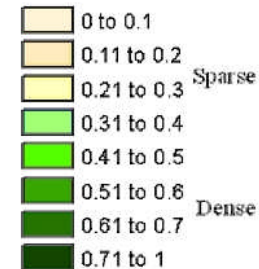
MY 2007/08 - BENCHMARK



MY 2010/11 - CURRENT



NDVI



Irrigated Agriculture
Rainfed Agriculture



Data Source: MODIS NDVI
University of Maryland
USDA/FAS/OGA/IPAD

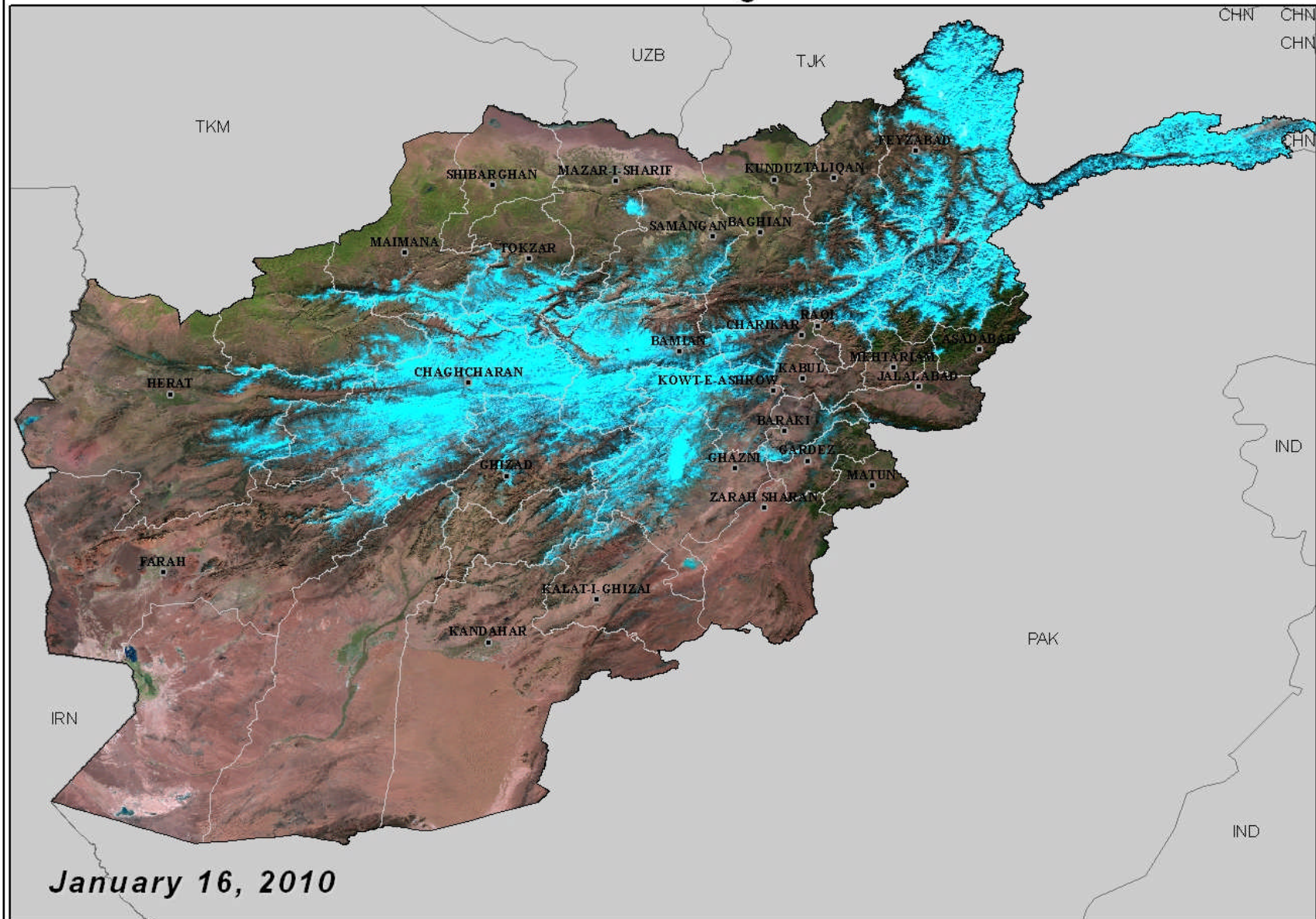
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Figure 4. MODIS NDVI images over the winter grains season comparing MY 2007/08 benchmark grain production year to the current season.

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MODIS 721 False-Color Image: MY 2010/11



Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

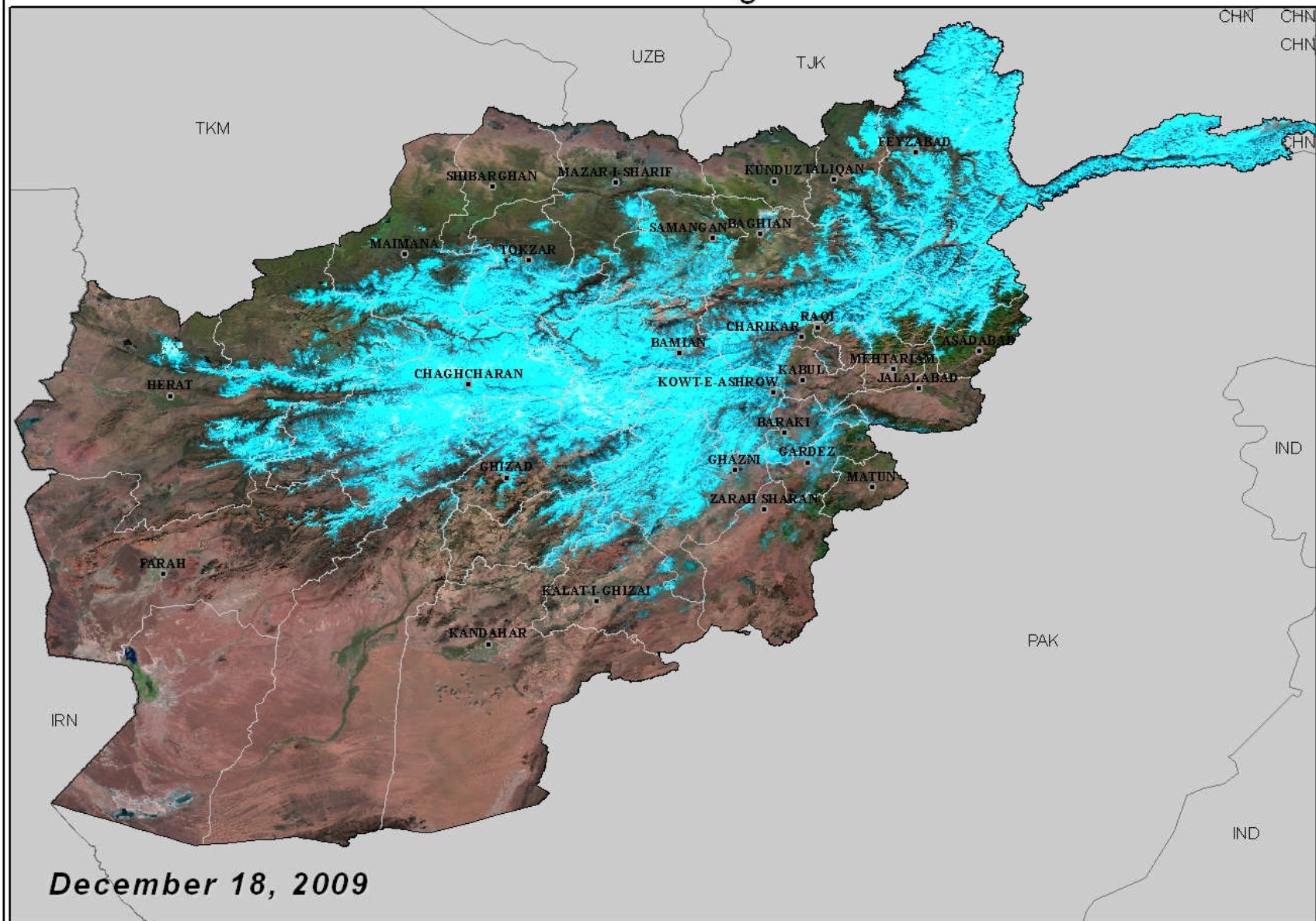
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Figure 5. MODIS false color, cloud free composite over Afghanistan for the current month, January 8-16, 2010

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MODIS 721 False-Color Image: MY 2010/11



December 18, 2009

Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

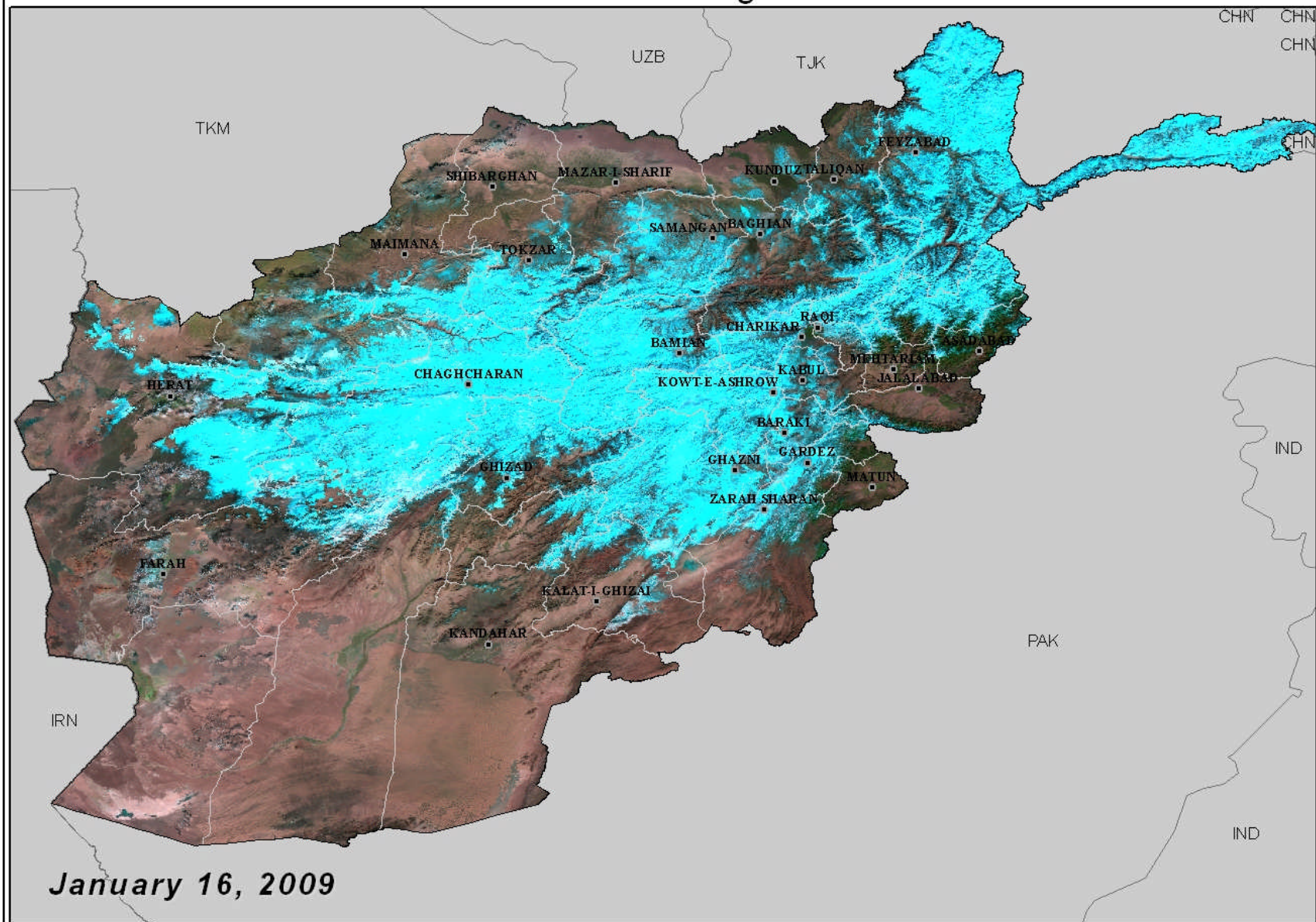
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Figure 6. MODIS false color, cloud free composite over Afghanistan for the previous month, December 10-18, 2009

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MODIS 721 False-Color Image: MY 2009/10



Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

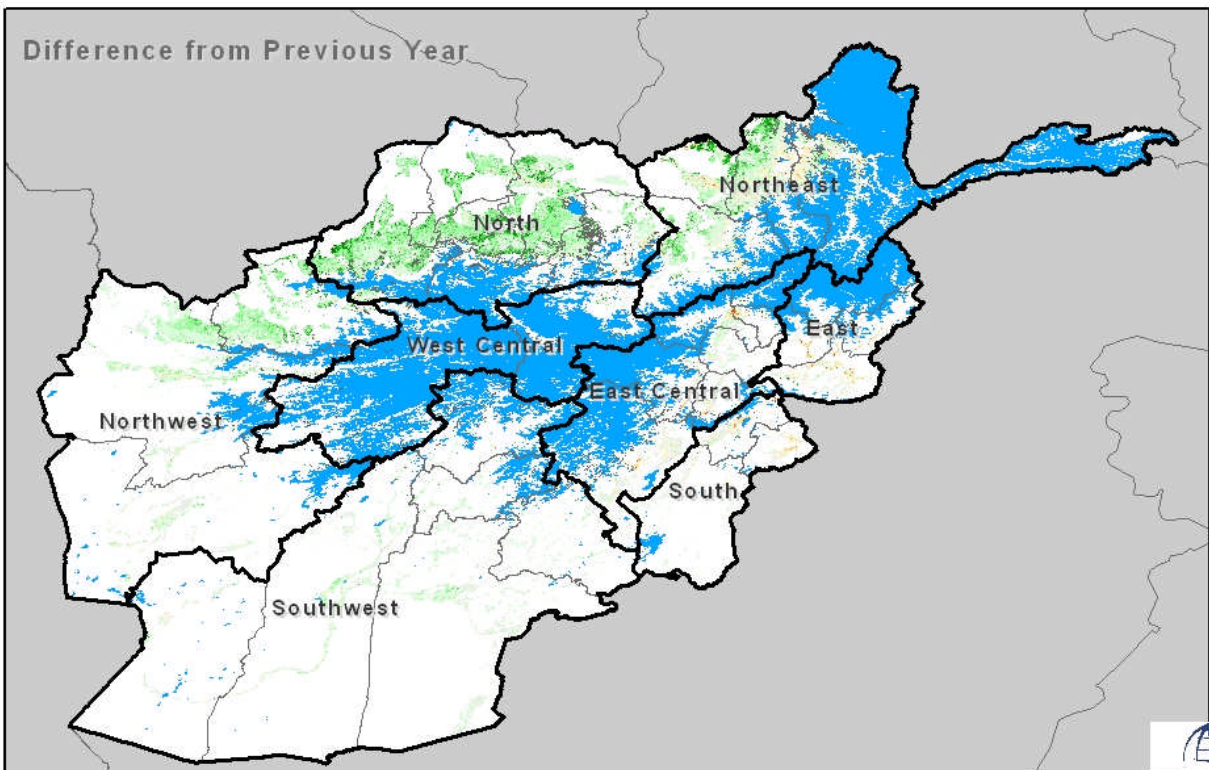
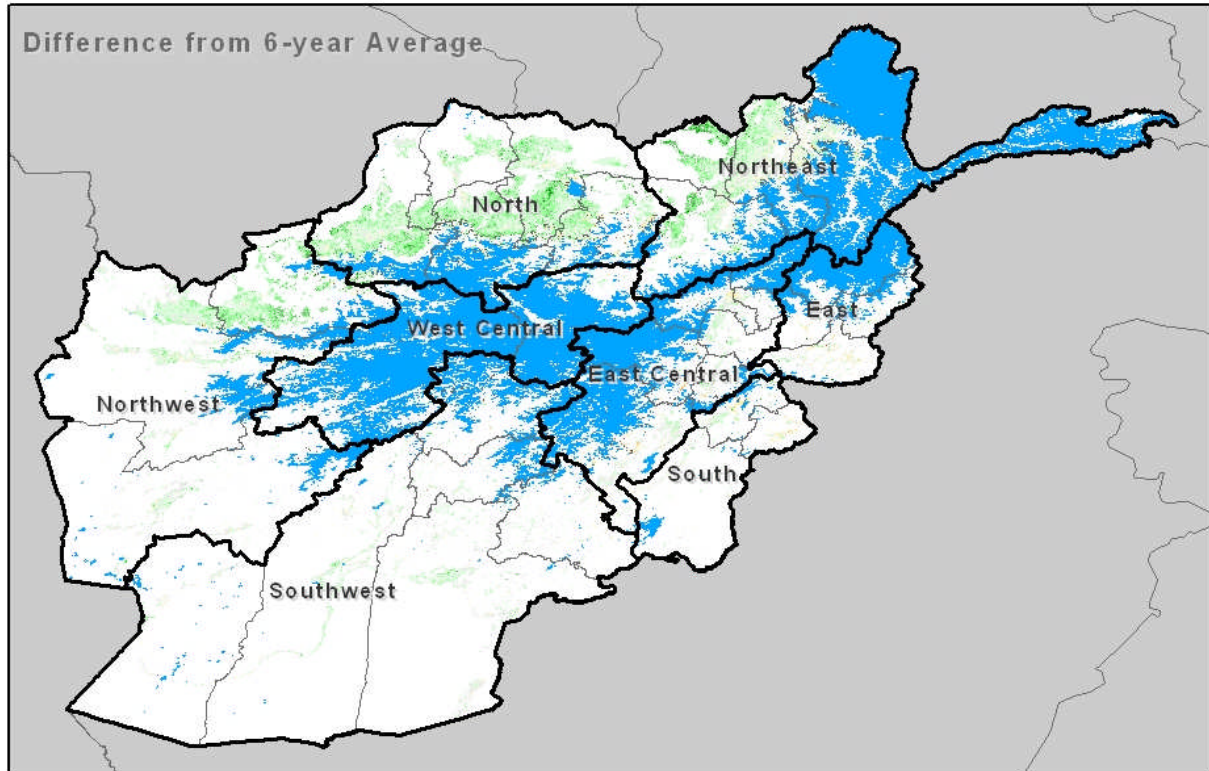
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Figure 7. MODIS false color, cloud free composite over Afghanistan for the current month, last year, January 8-16, 2009

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MODIS NDVI Change Analysis: January 3, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer



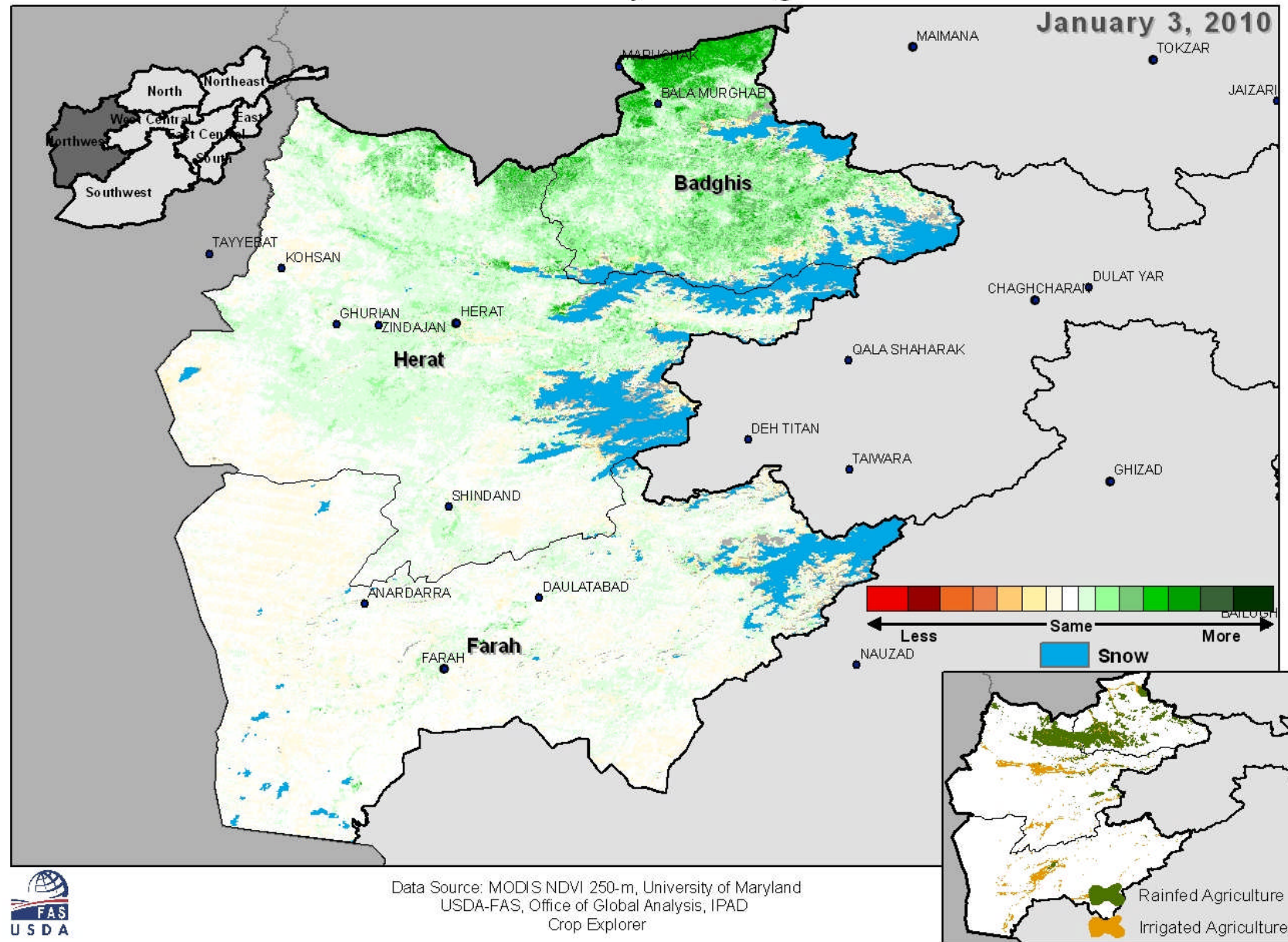
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Figure 8. MODIS NDVI change comparing current MY 2010/11 NDVI against the previous 6-year average and against the previous season (MY 2009/10)

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MODIS NDVI Difference from 6yr Average: Northwest Provinces



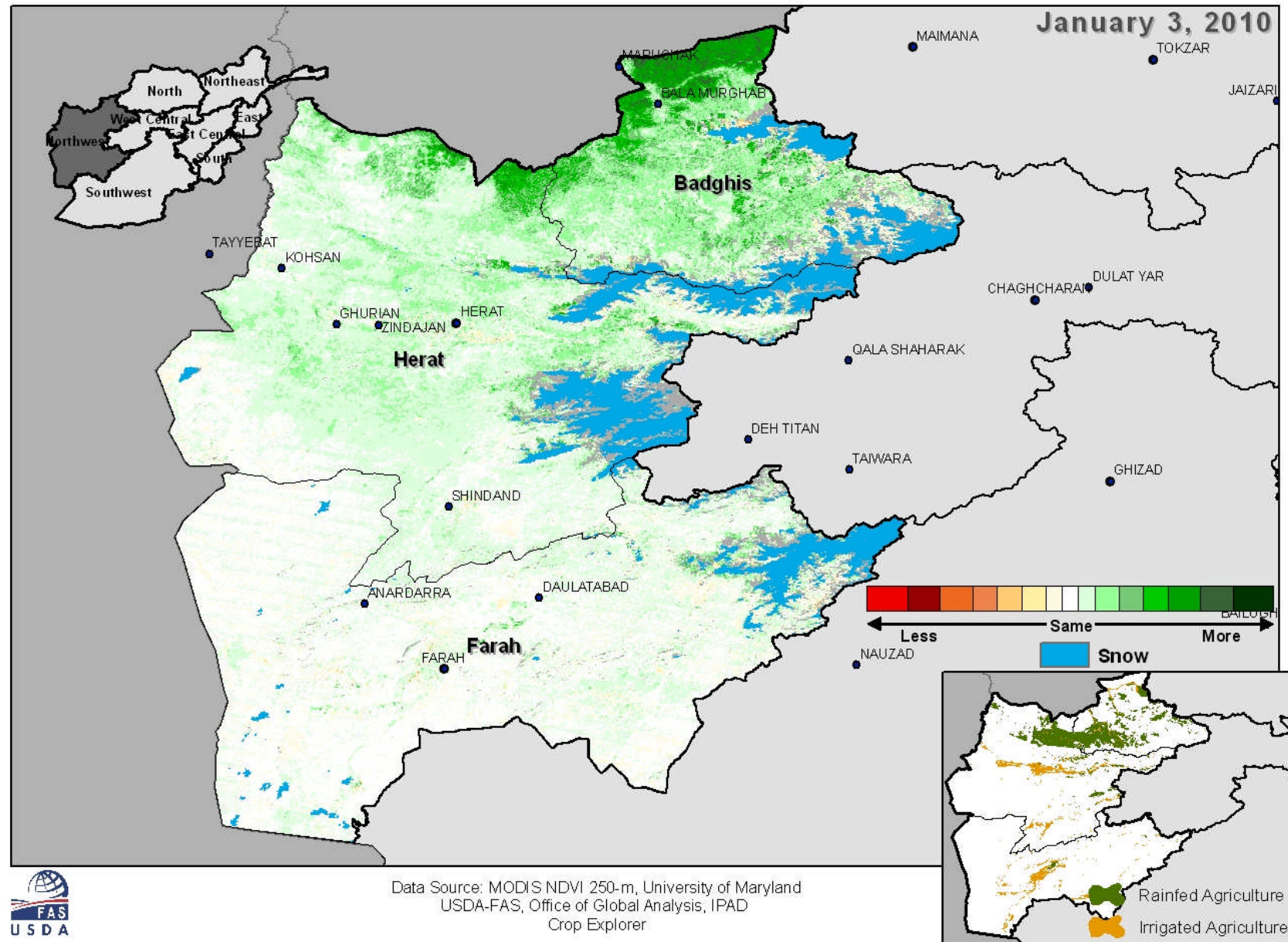
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Figure 9. MODIS NDVI comparing current conditions against previous 6-year average, Northwest Provinces

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MODIS NDVI Difference from Last Year: Northwest Provinces



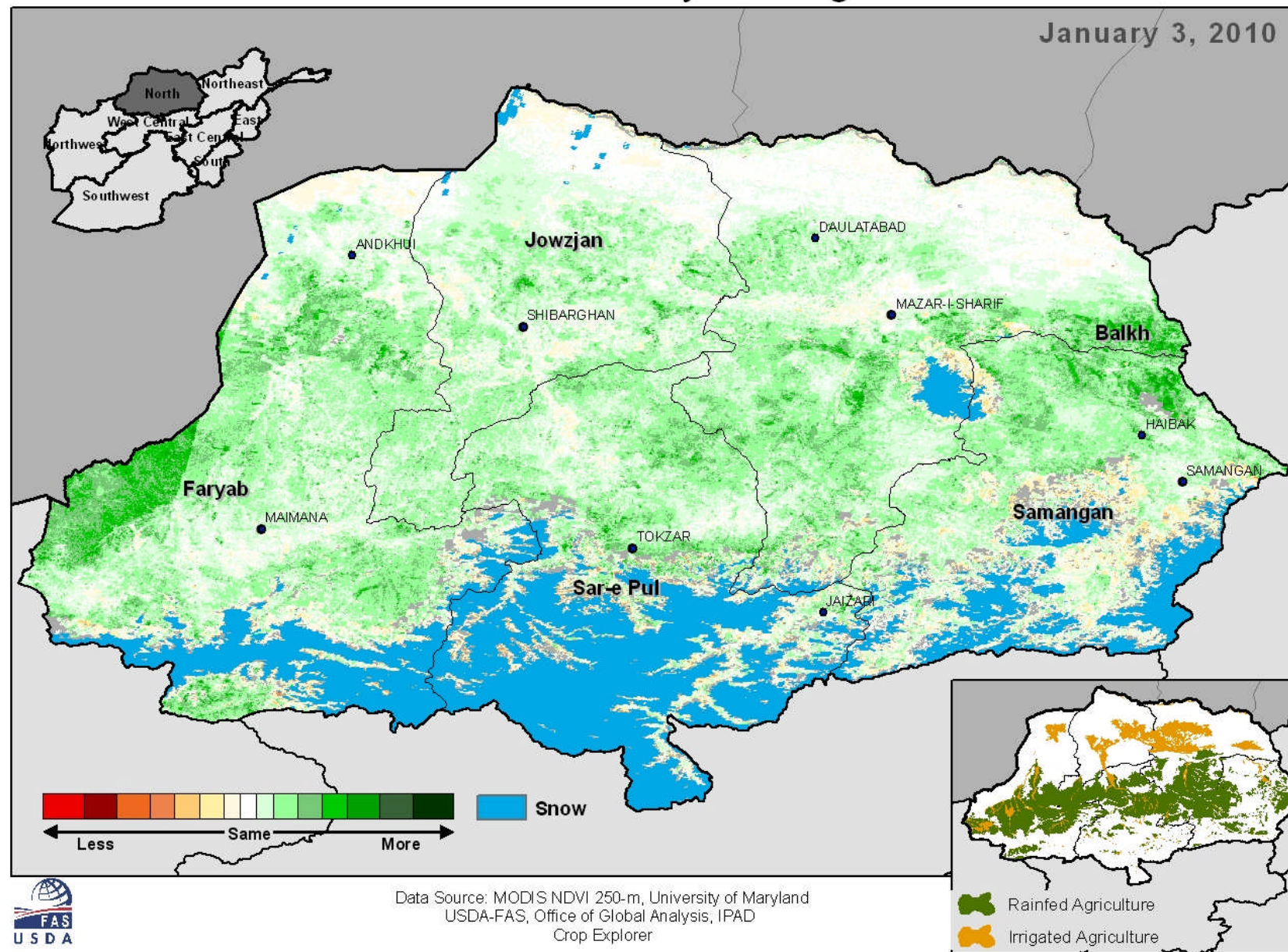
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Figure 10. MODIS NDVI comparing current conditions against previous season (MY 2009/10), Northwest Provinces

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MODIS NDVI Difference from 6yr Average: North Provinces



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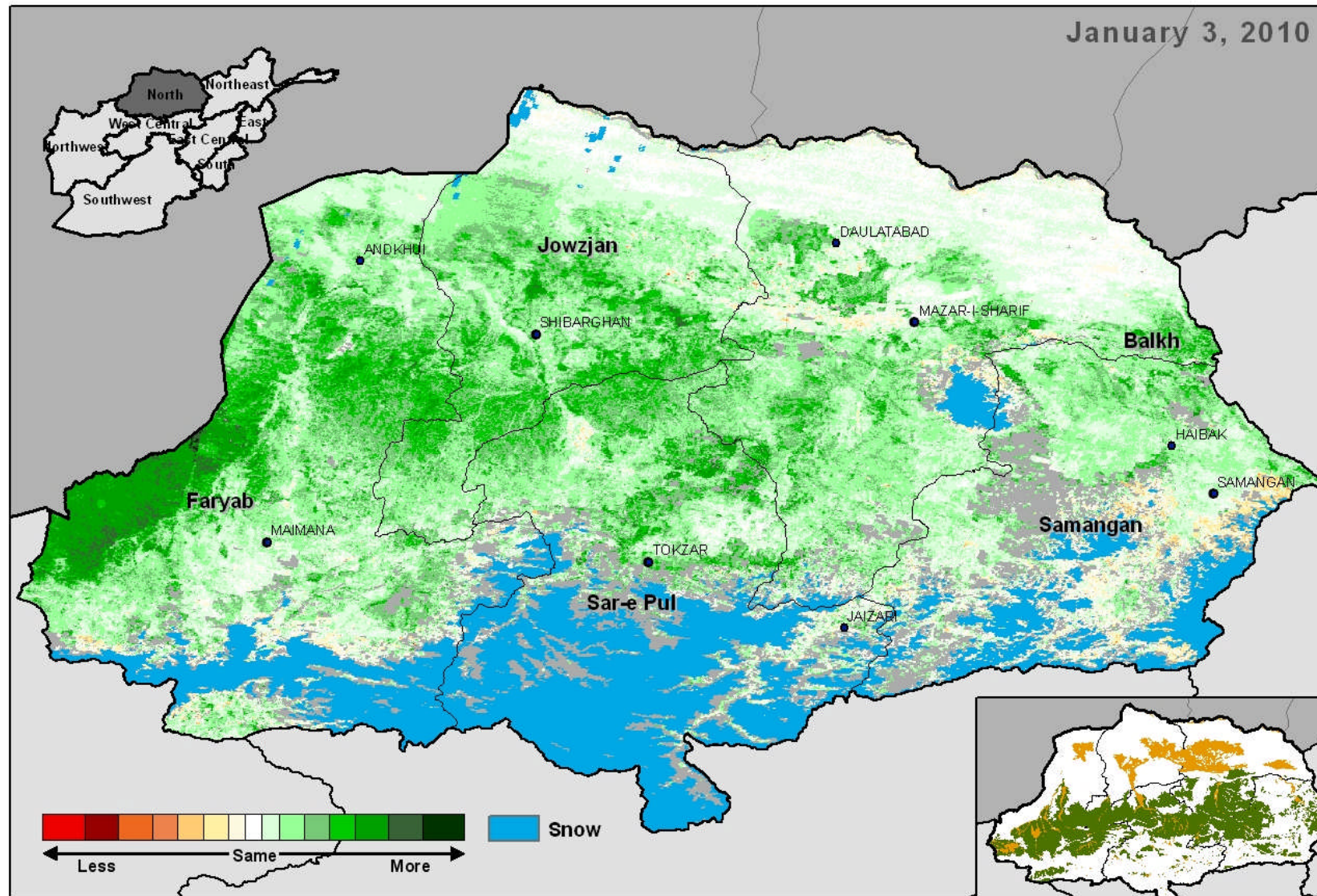
Figure 11. MODIS NDVI comparing current conditions against previous 6-year average, North Provinces

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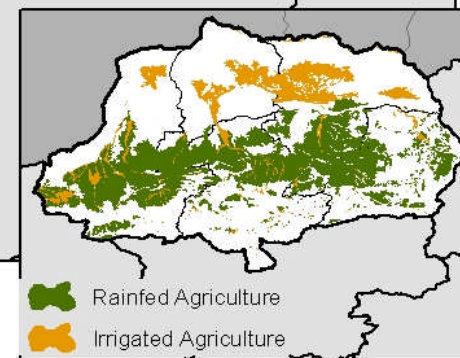
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MODIS NDVI Difference from Last Year: North Provinces

January 3, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer



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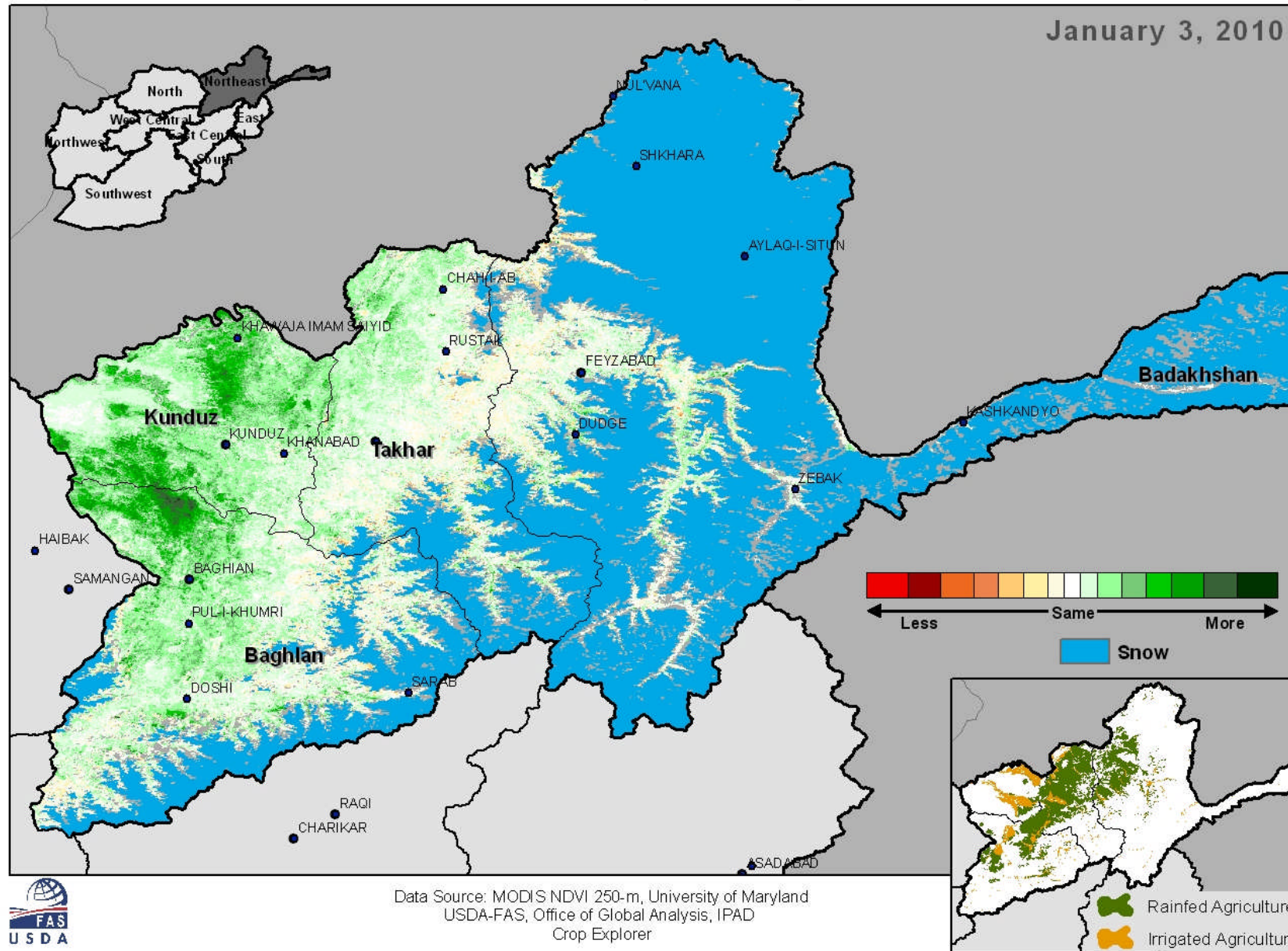
Figure 12. MODIS NDVI comparing current conditions against previous 6-year average, North Provinces

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MODIS NDVI Difference from 6yr Average: Northeast Provinces

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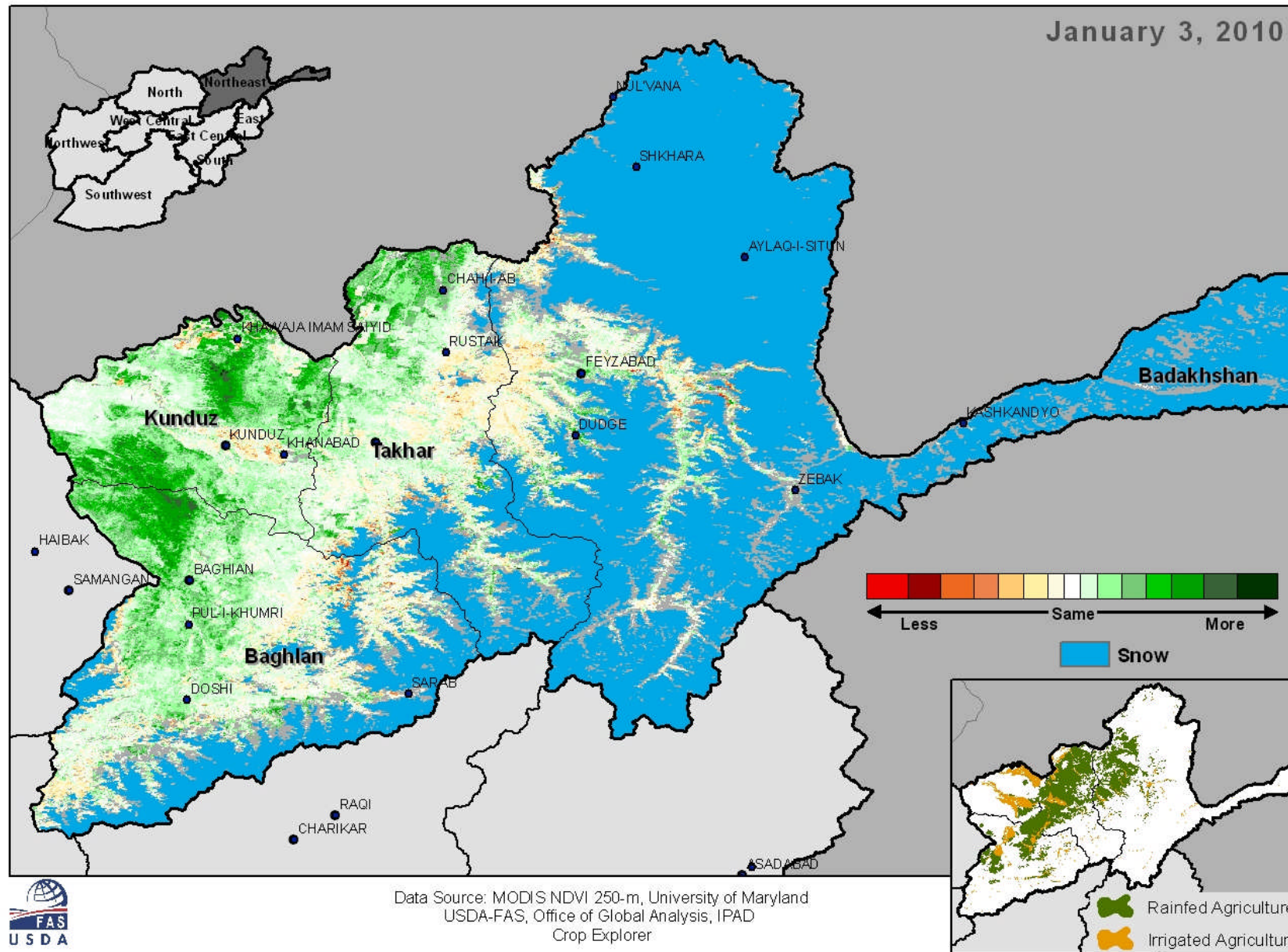
Figure 13. MODIS NDVI comparing current conditions against previous 6-year average, Northeast Provinces

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MODIS NDVI Difference from Last Year: Northeast Provinces

January 3, 2010



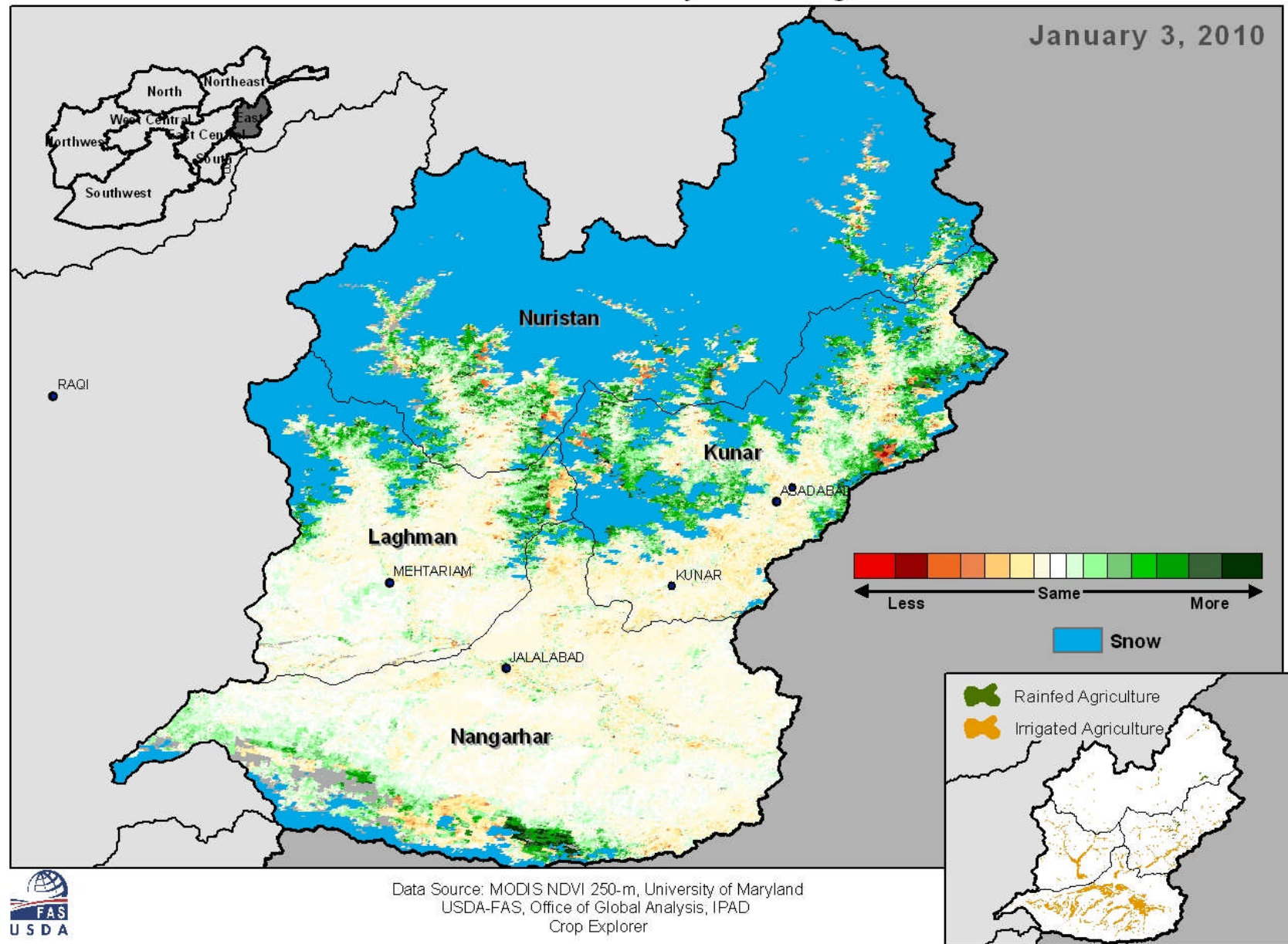
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Figure 14. MODIS NDVI comparing current conditions against previous 6-year average, Northeast Provinces

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MODIS NDVI Difference from 6yr Average: East Provinces



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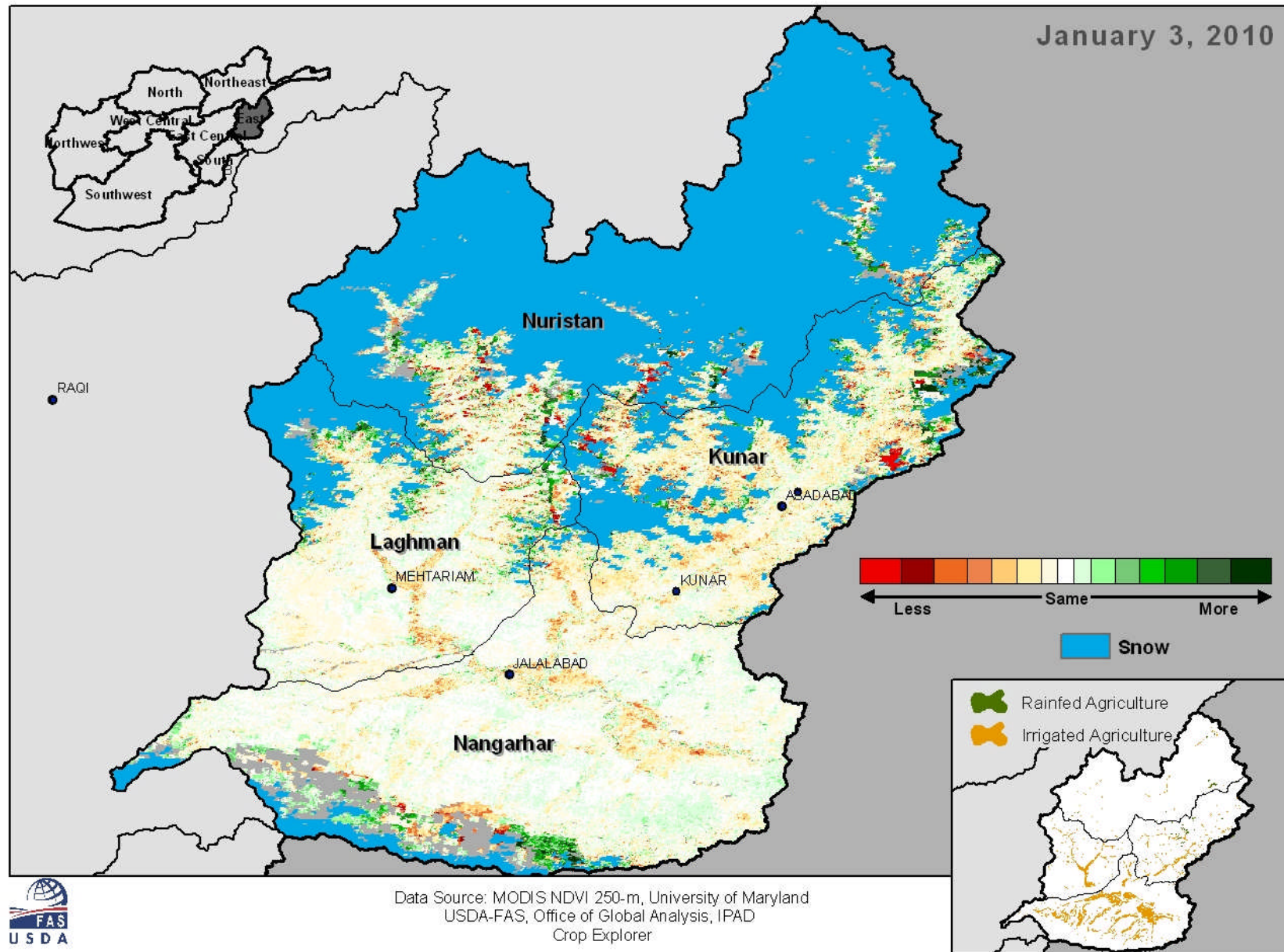
Figure 15. MODIS NDVI comparing current conditions against previous 6-year average, East Provinces

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MODIS NDVI Difference from Last Year: East Provinces

January 3, 2010



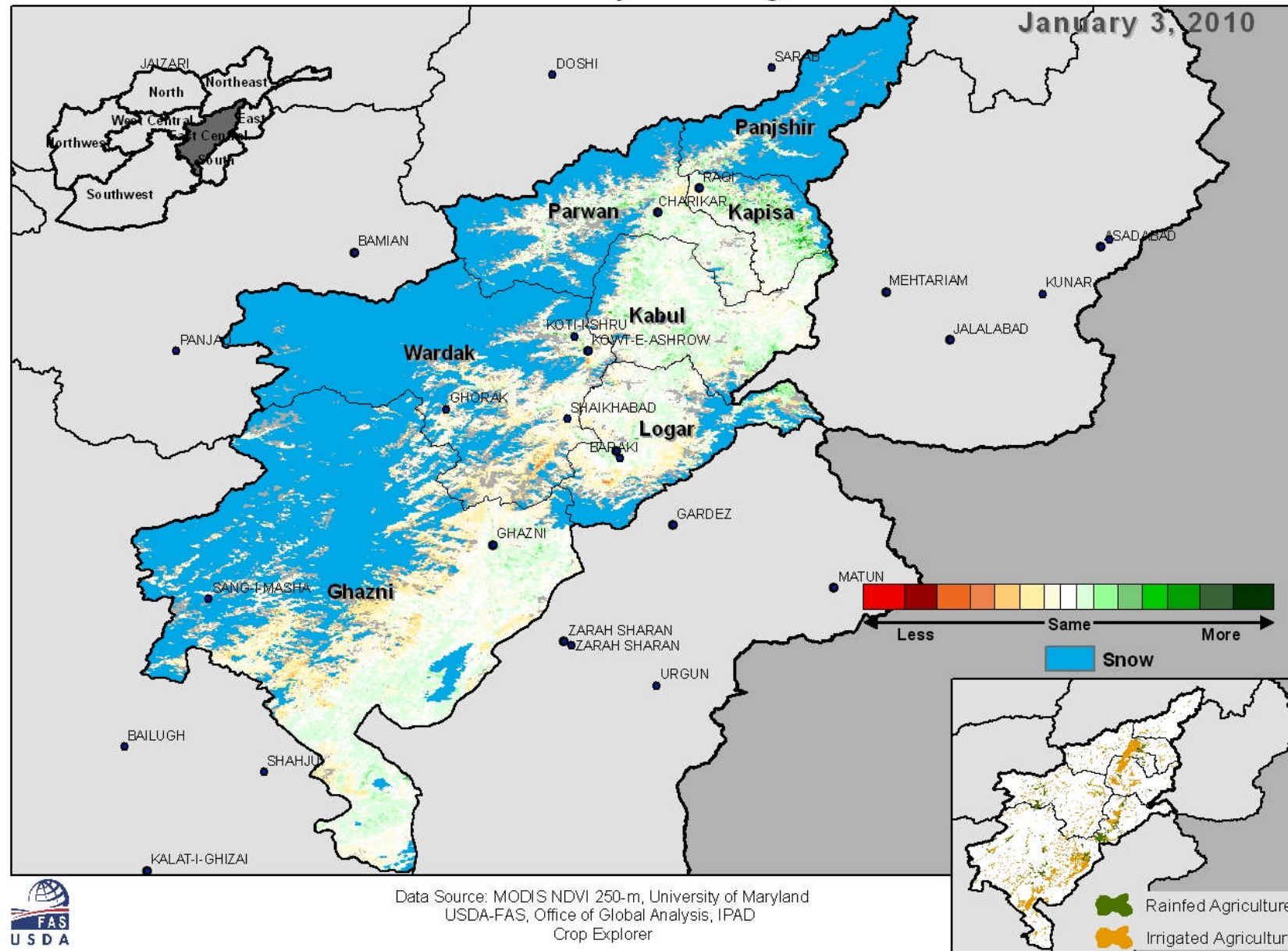
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Figure 16. MODIS NDVI comparing current conditions against previous 6-year average, East Provinces

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MODIS NDVI Difference from 6yr Average: East Central Provinces



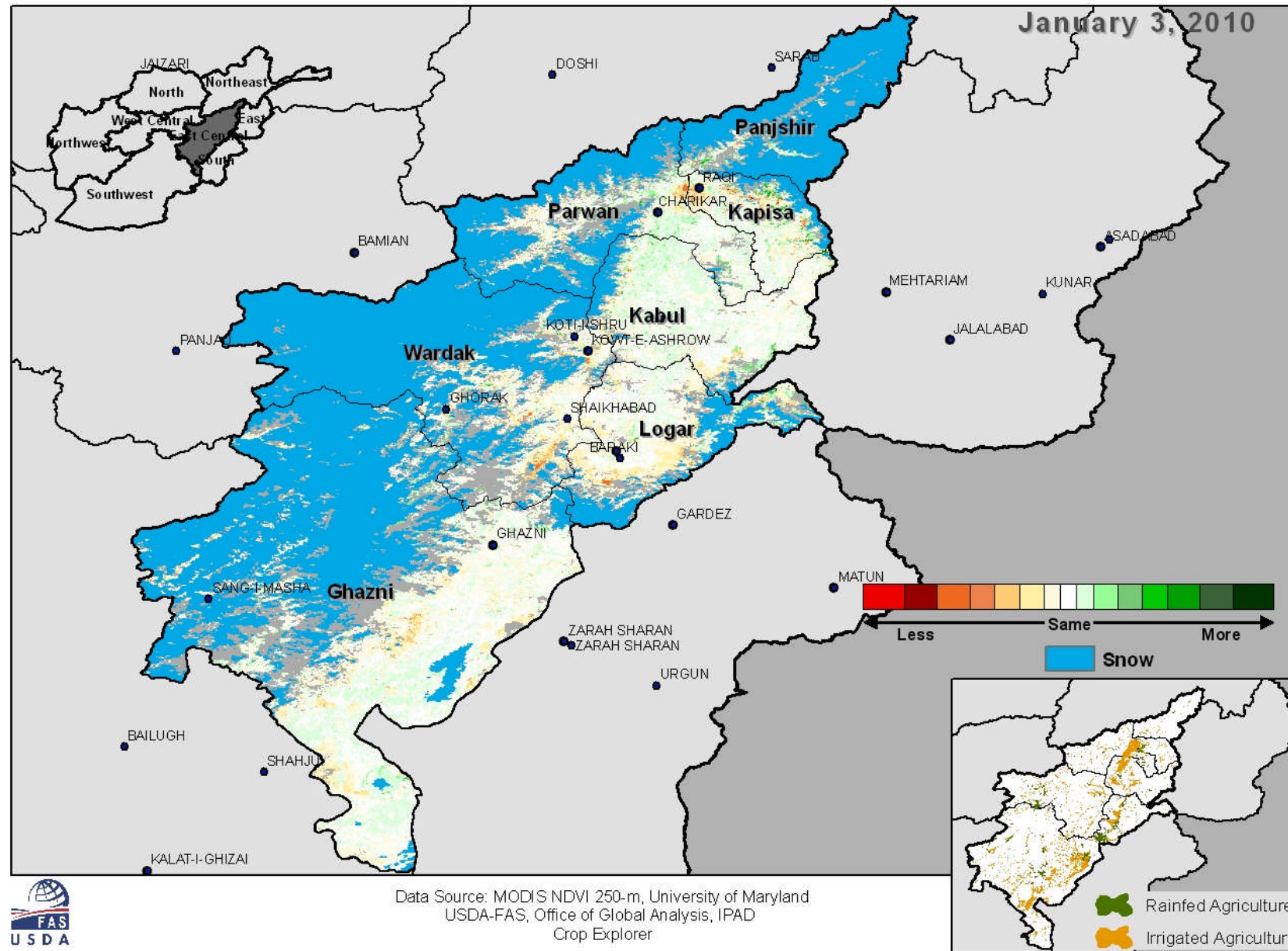
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Figure 17. MODIS NDVI comparing current conditions against previous 6-year average, East Central Provinces

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MODIS NDVI Difference from Last Year: East Central Provinces



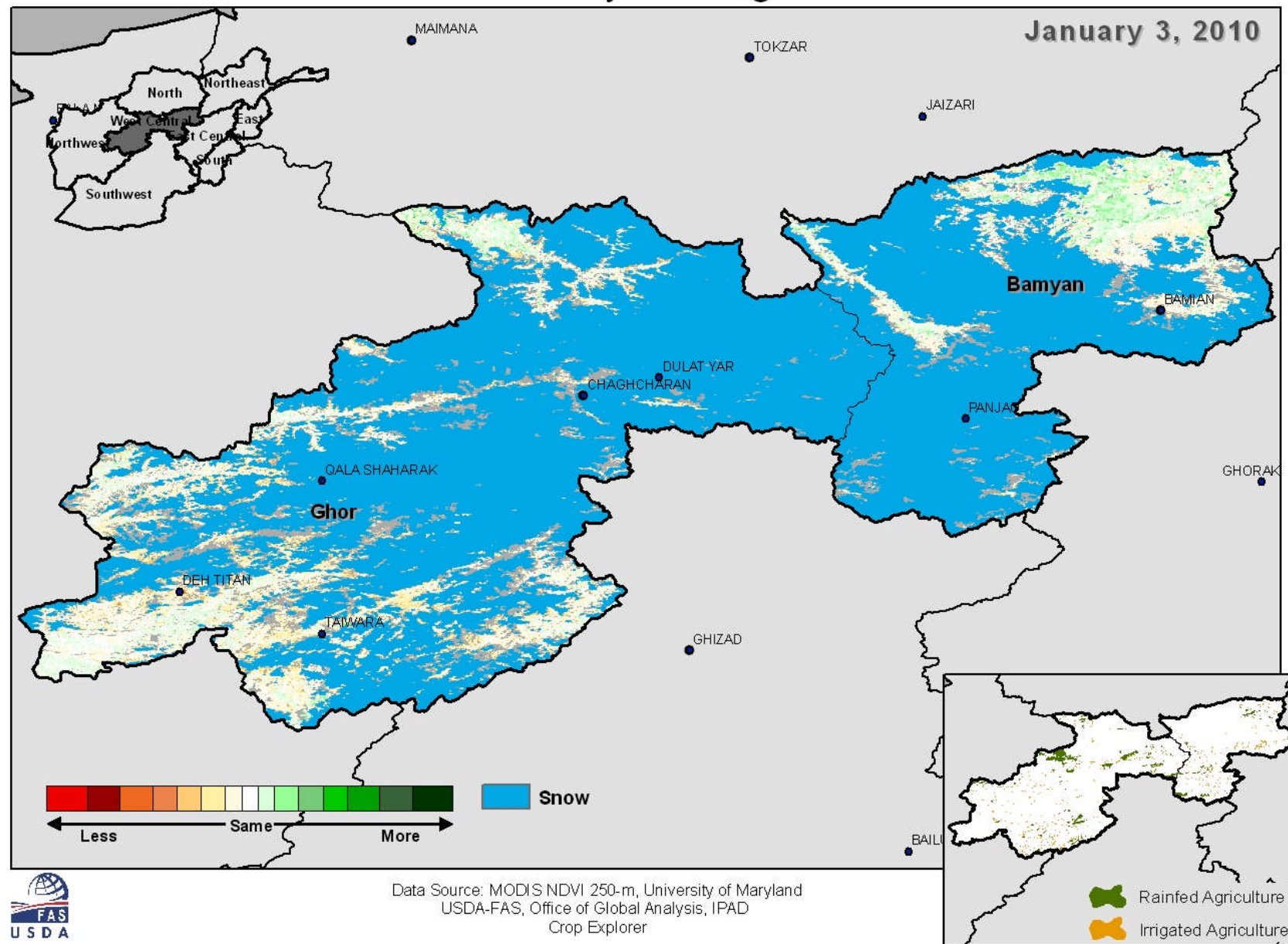
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Figure 18. MODIS NDVI comparing current conditions against previous 6-year average, East Central Provinces

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MODIS NDVI Difference from 6yr Average: West Central Provinces



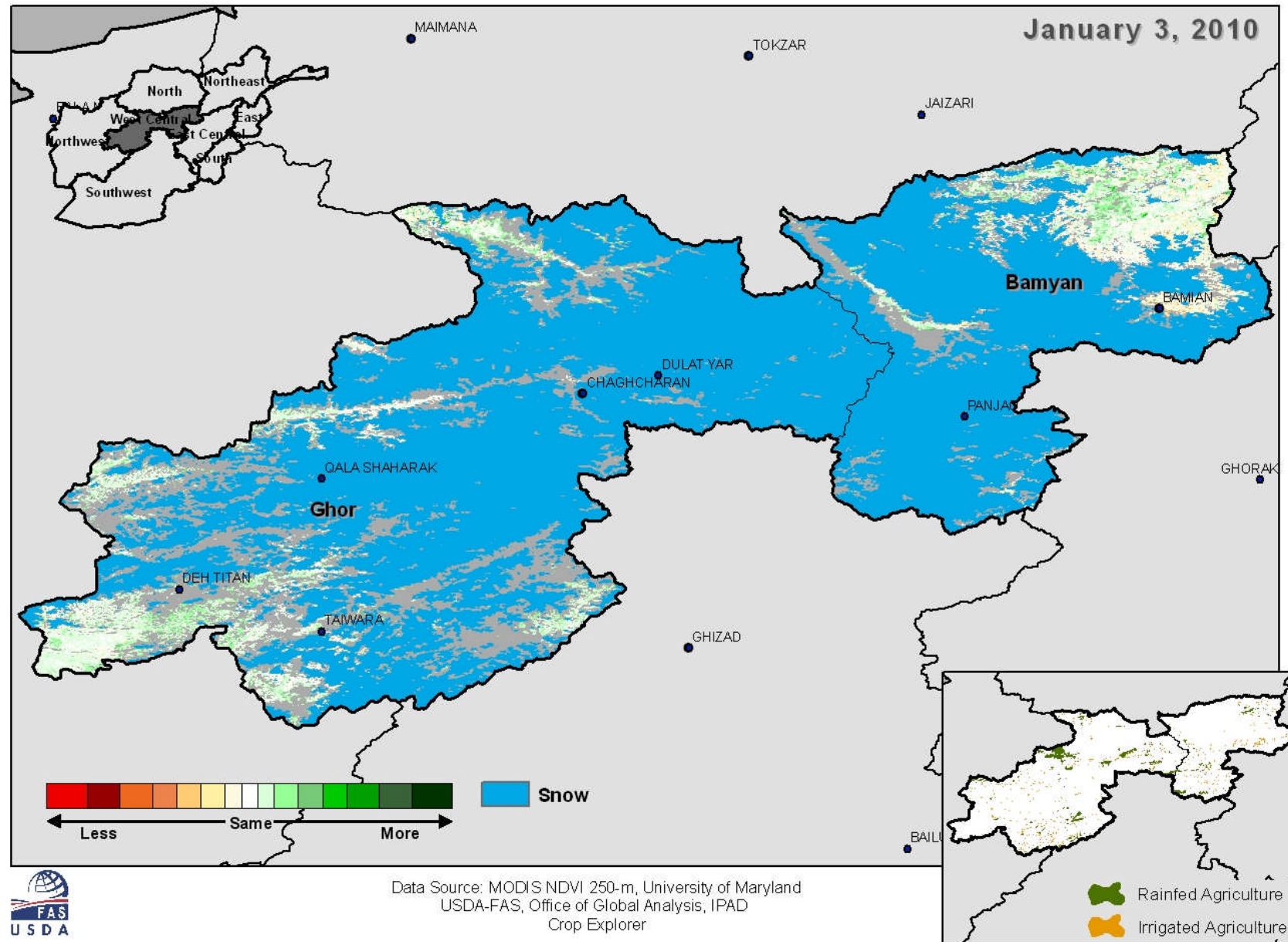
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Figure 19. MODIS NDVI comparing current conditions against previous 6-year average, West Central Provinces

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MODIS NDVI Difference from Last Year: West Central Provinces



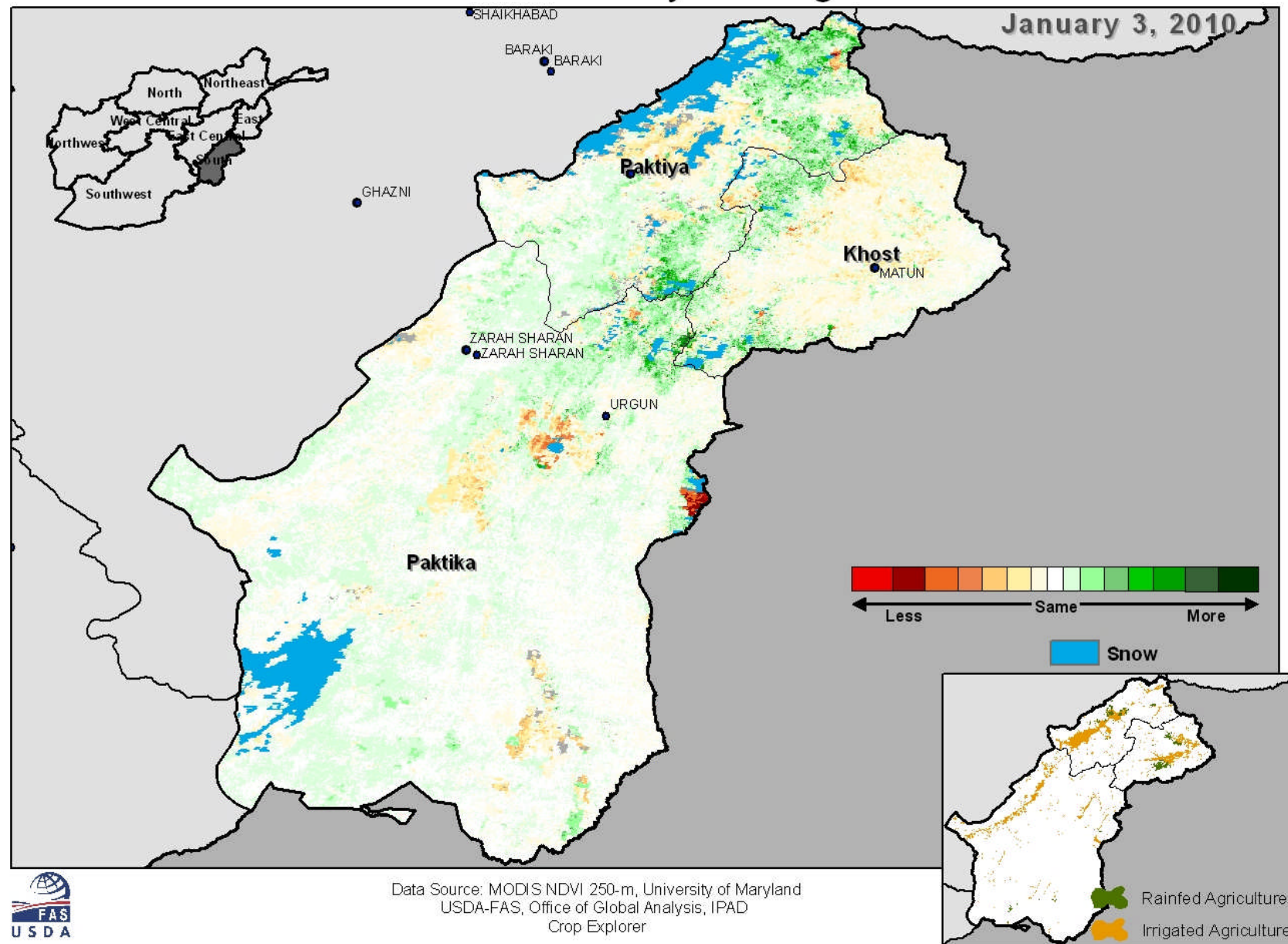
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Figure 20. MODIS NDVI comparing current conditions against previous 6-year average, West Central Provinces

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MODIS NDVI Difference from 6yr Average: South Provinces

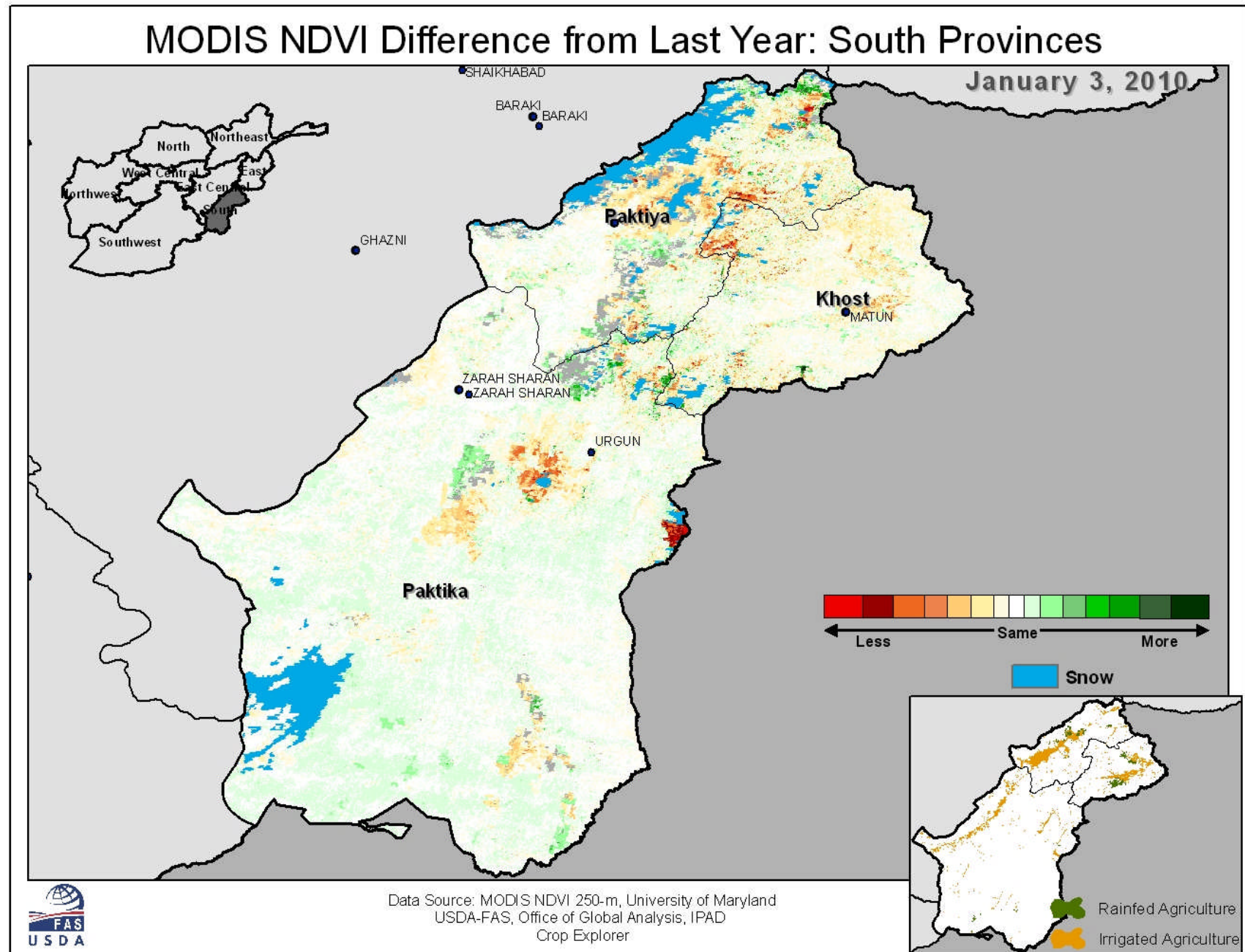


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Figure 21. MODIS NDVI comparing current conditions against previous 6-year average, South Provinces

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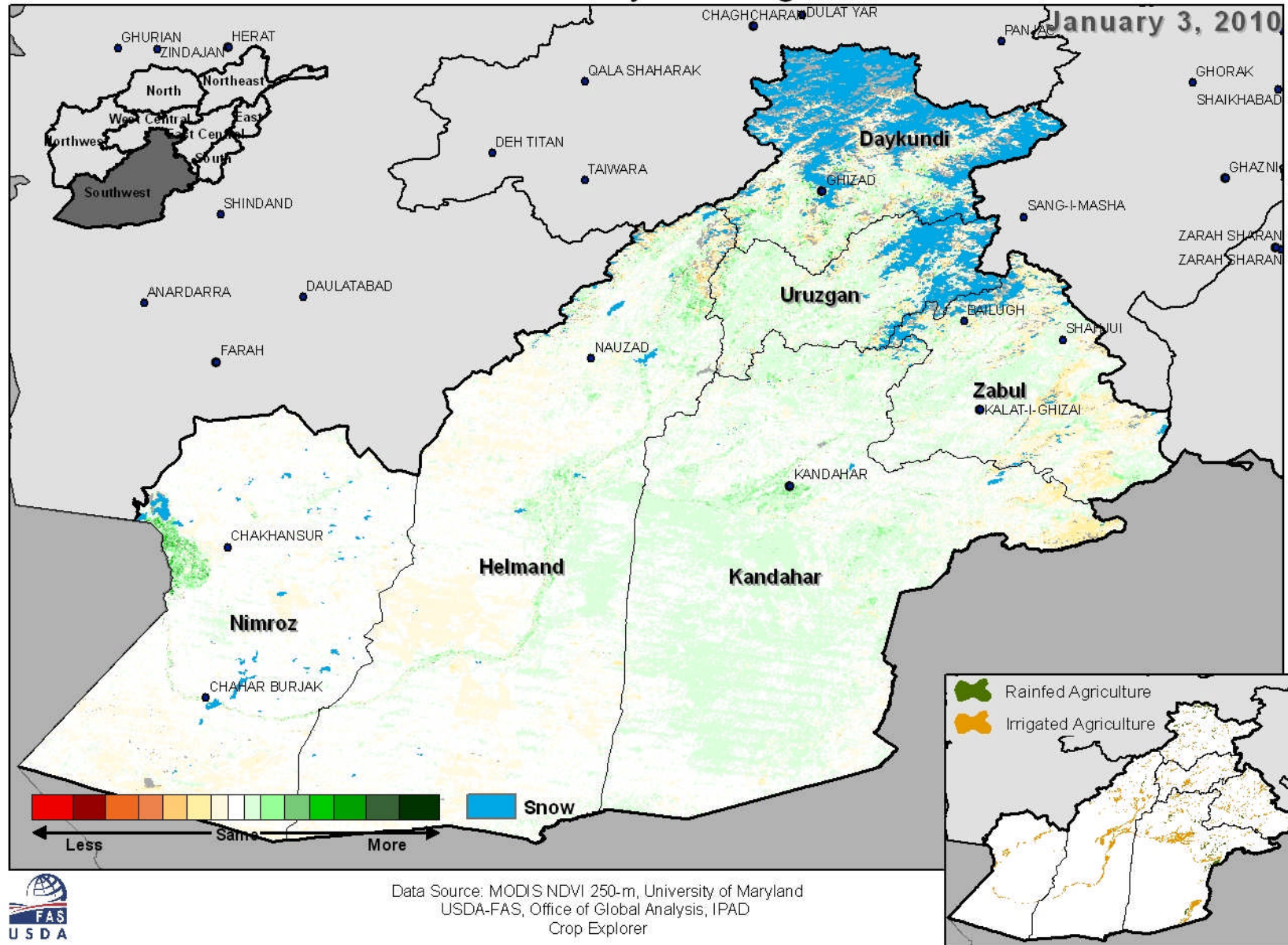
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Figure 22. MODIS NDVI comparing current conditions against previous 6-year average, South Provinces

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MODIS NDVI Difference from 6yr Average: Southwest Provinces



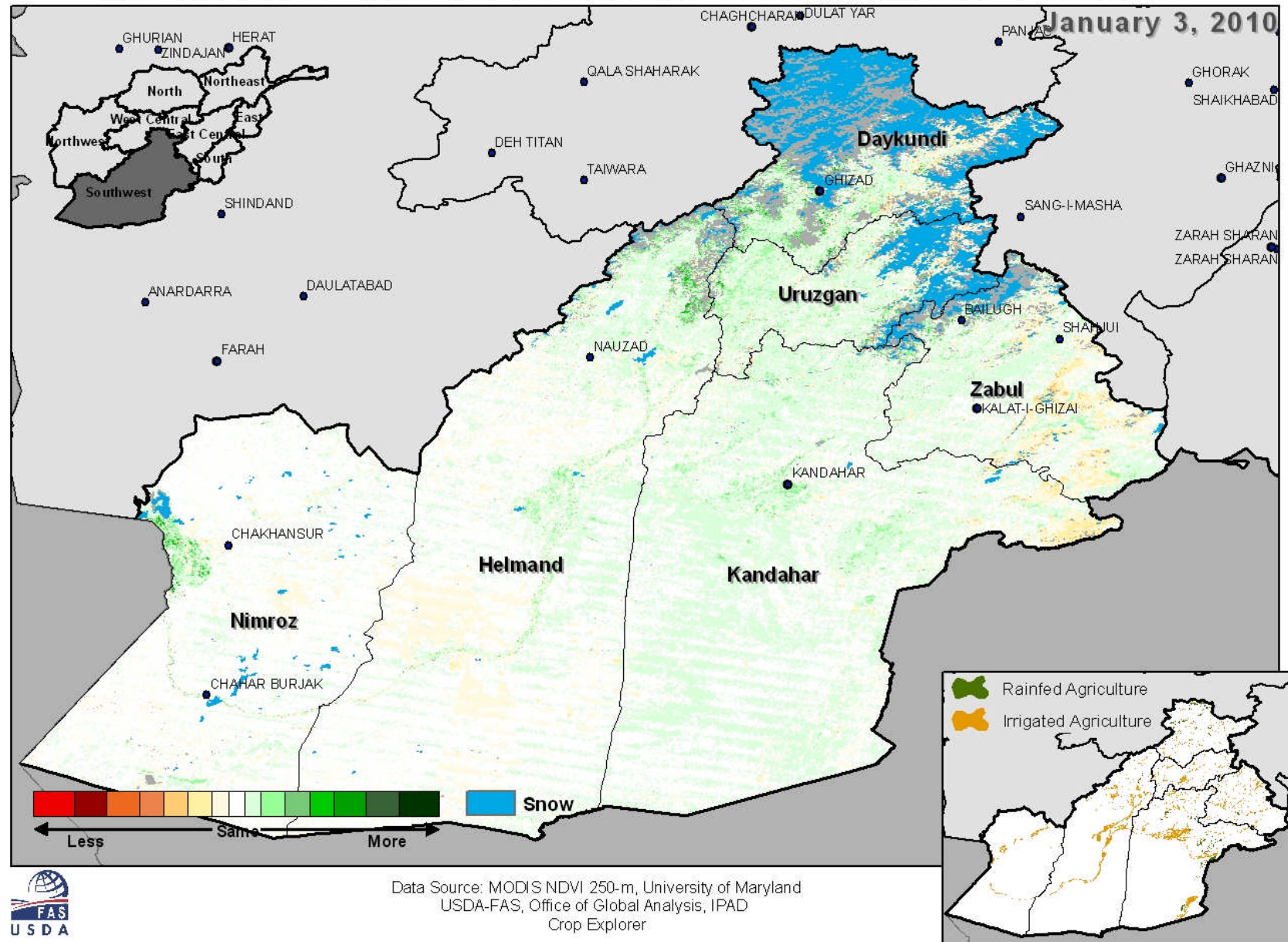
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Figure 23. MODIS NDVI comparing current conditions against previous 6-year average, Southwest Provinces

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MODIS NDVI Difference from Last Year: Southwest Provinces



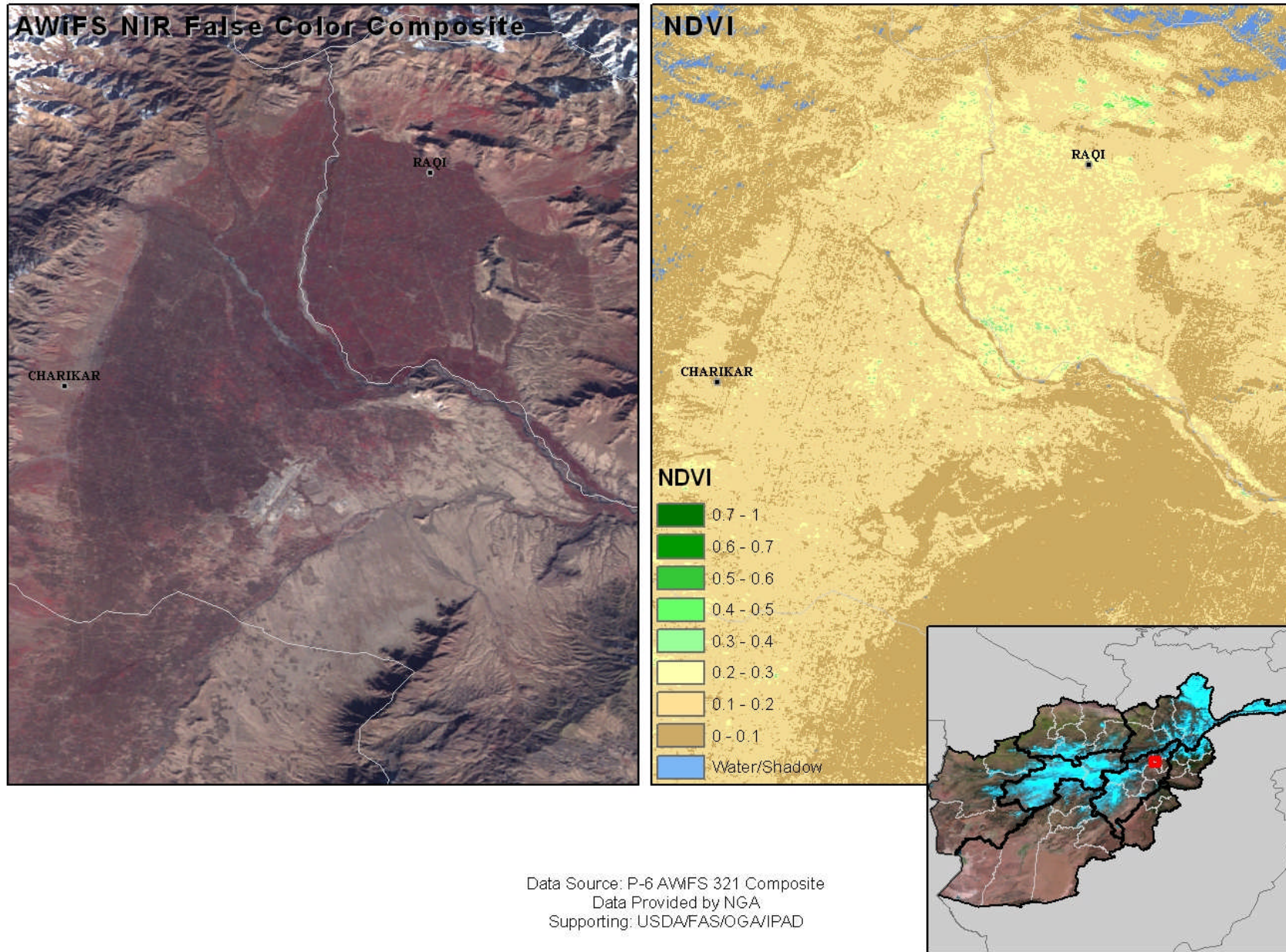
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Figure 24. MODIS NDVI comparing current conditions against previous 6-year average, Southwest Provinces

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Kohdaman Valley Vegetation: January 10, 2010



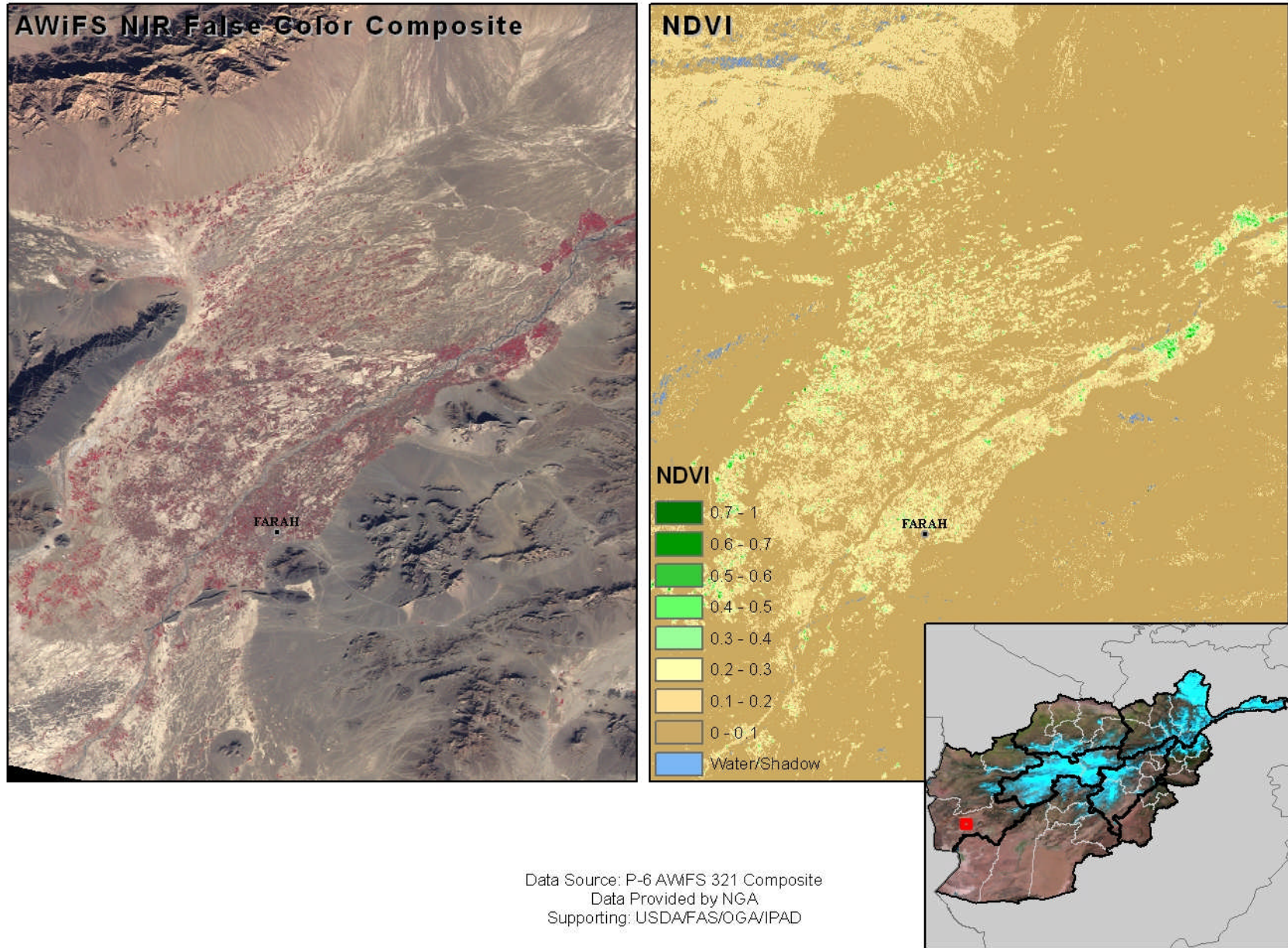
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Figure 25. Medium resolution satellite imagery highlighting early season agricultural vegetation in Kohdaman Valley, Afghanistan.

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Farah, Afghanistan: January 9, 2010



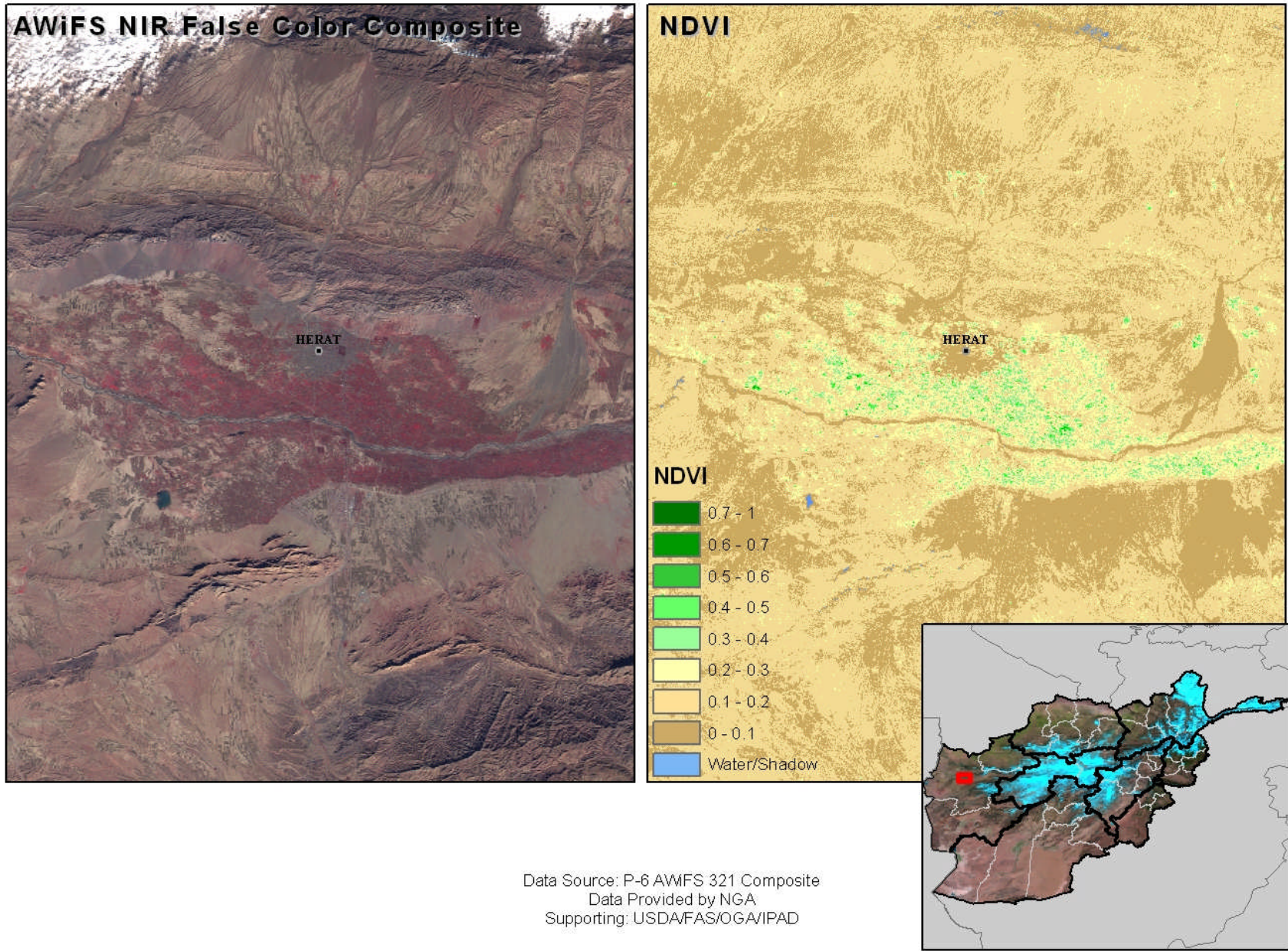
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Figure 26. Medium resolution satellite imagery highlighting early season agricultural vegetation in Farah province, Afghanistan.

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Herat, Afghanistan: January 9, 2010



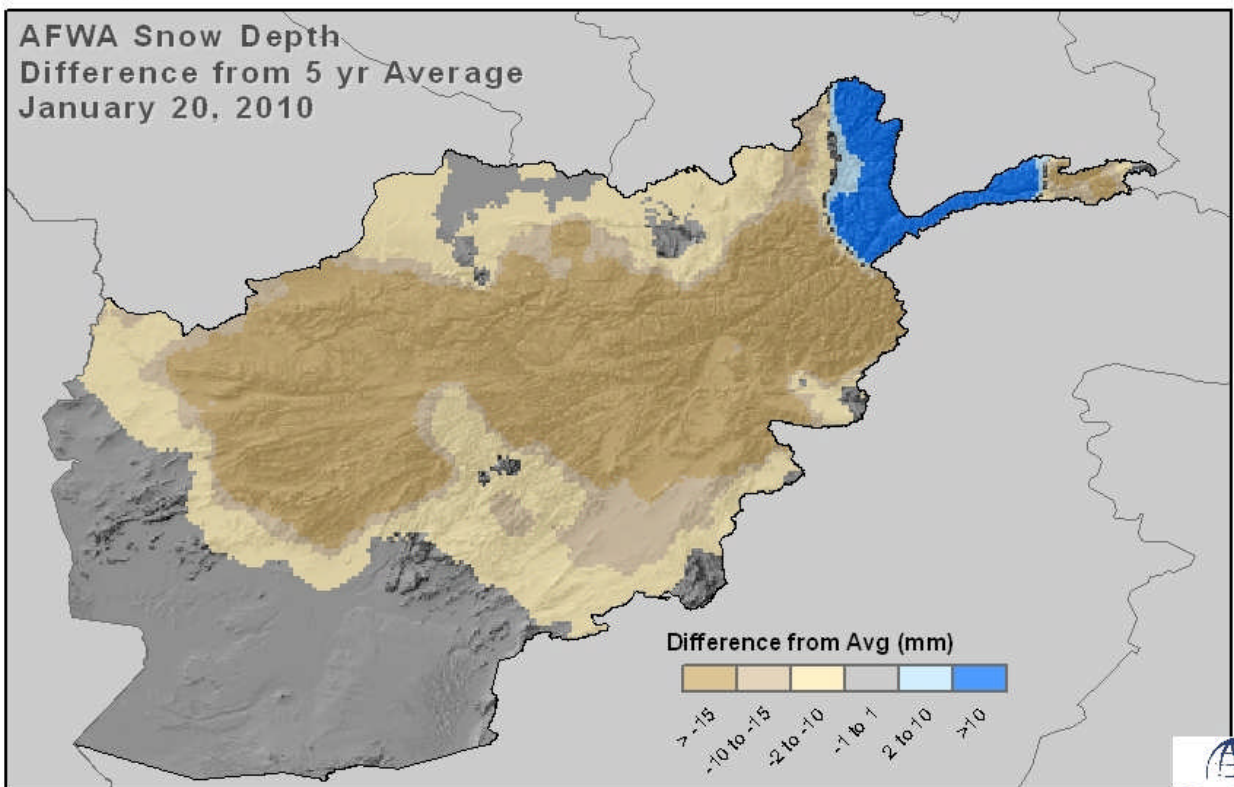
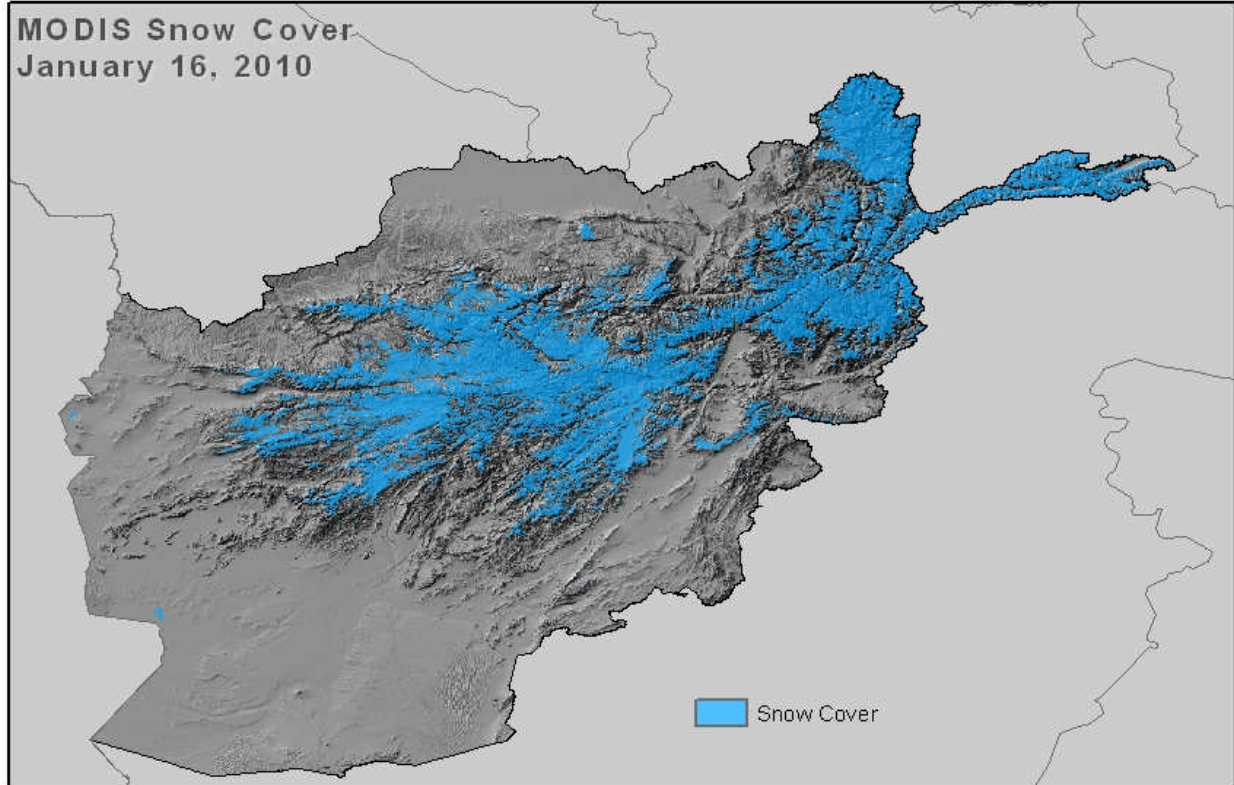
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Figure 27. Medium resolution satellite imagery highlighting early season agricultural vegetation in Herat province, Afghanistan

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Snow Cover and Depth Difference from Average



Data Source: MODIS Snow Cover; AFWA Snow Depth
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD

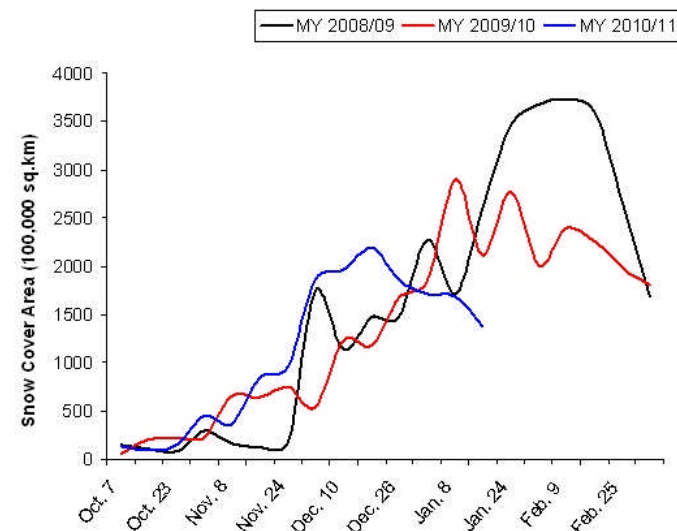
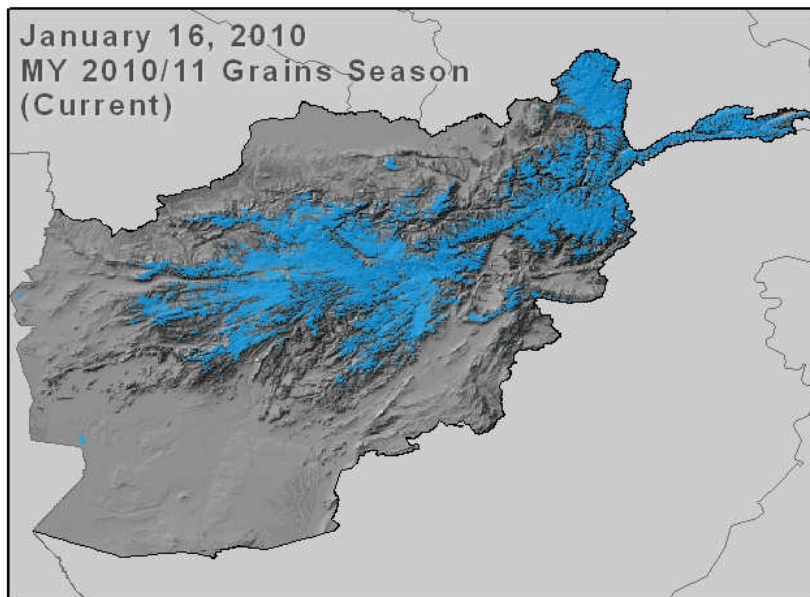
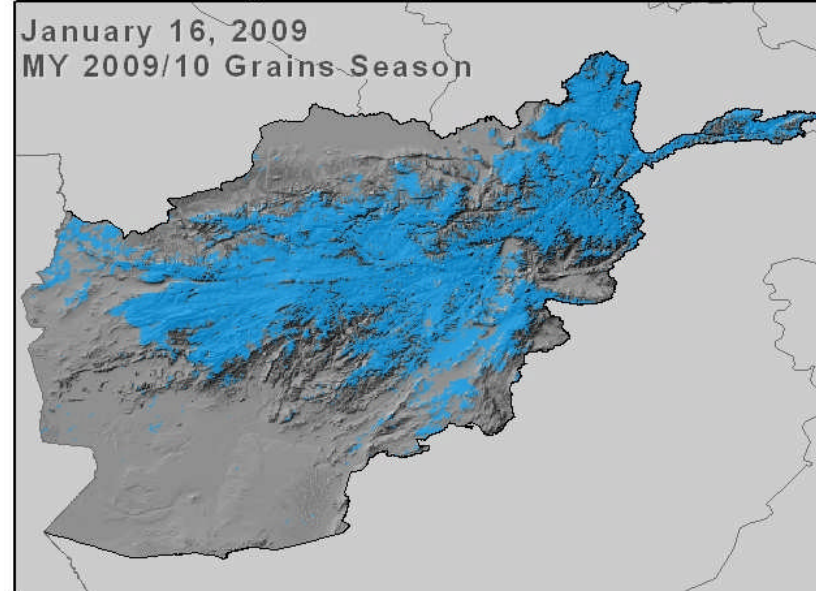
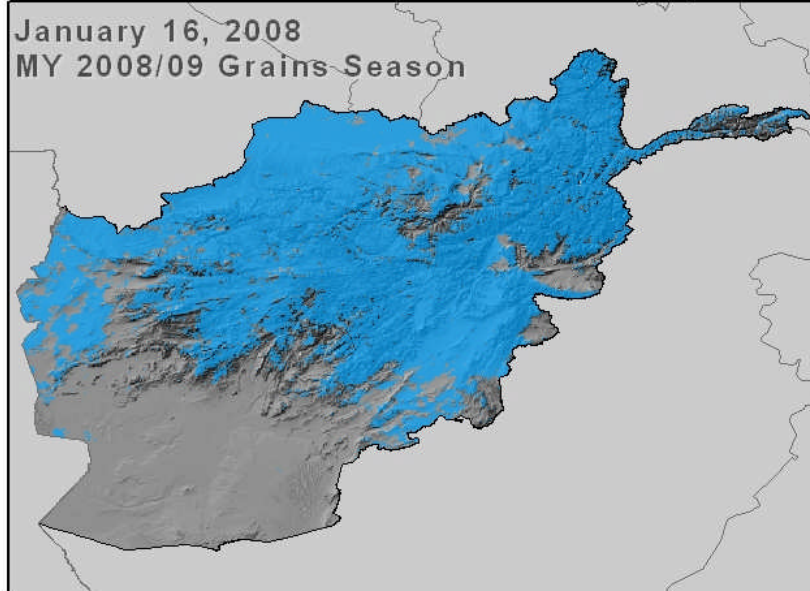


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Figure 28. MODIS snow cover and AFWA snow depth difference from 5 year average.

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MODIS Snow Cover: Comparison January 2008, 2009 and 2010



Data Source: MODIS Snow Cover
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD



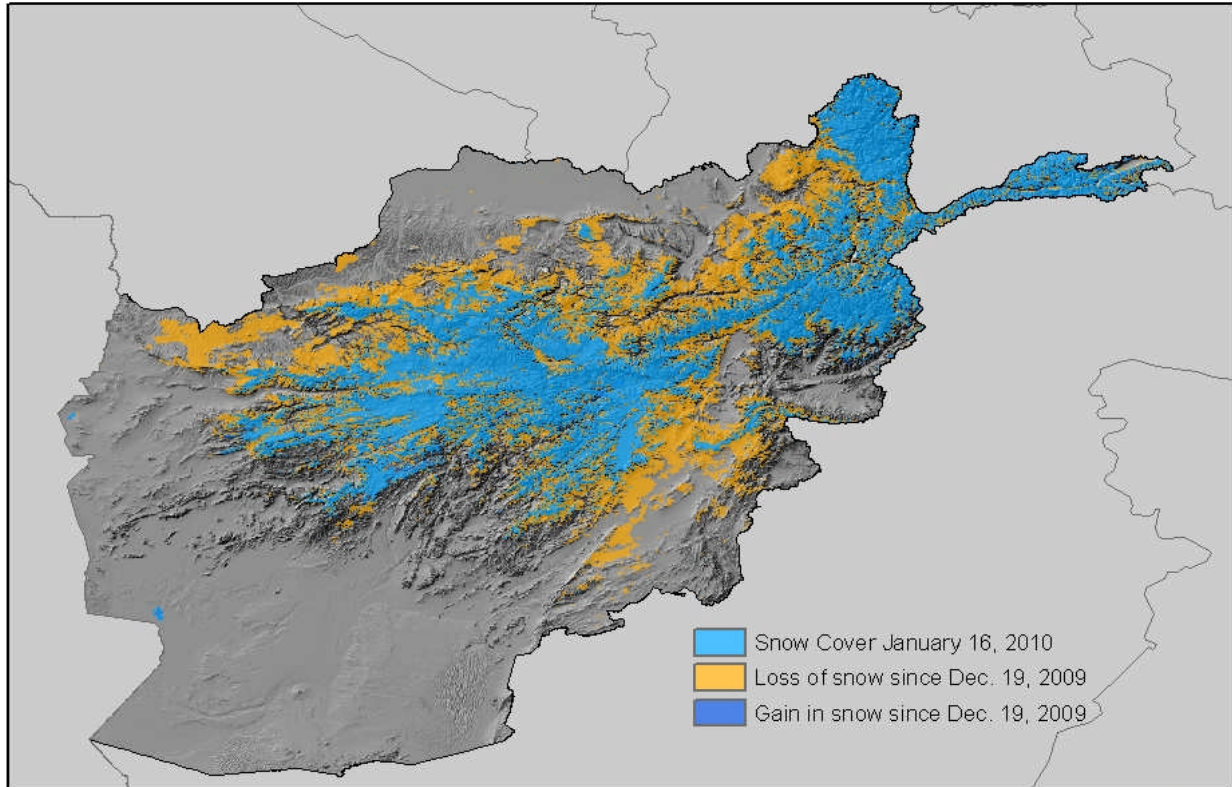
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Figure 29. Comparison of MODIS snow cover area between current season (MY 2010/11), last year (MY 2009/10) and the 2008 crop drought year (MY 2008/09)

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Change in Snow Area: December 2009 to January 2010



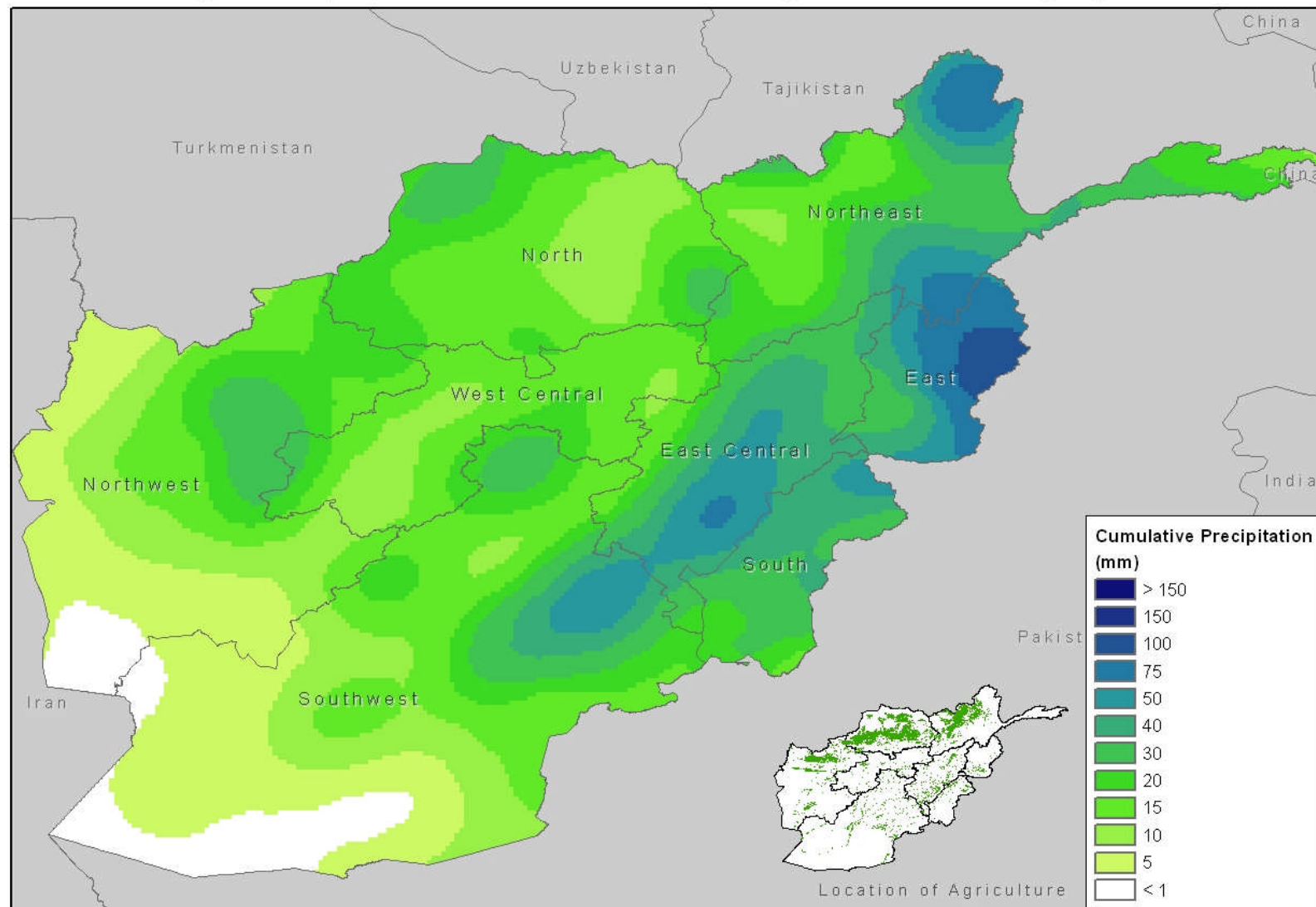
Data Source: MODIS Snow Cover; AFWA Snow Depth
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD



Figure 30. MODIS snow cover showing gains and losses of winter snow pack over the past month, December 2009 to January 2010.

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7-Day Precipitation Outlook: January 27 - February 3, 2010



Data Source: NOAA Global Forecast System (GFS)
Data Provided by: NOAA CPC
Supporting: USDA/FAS/OGA/IPAD



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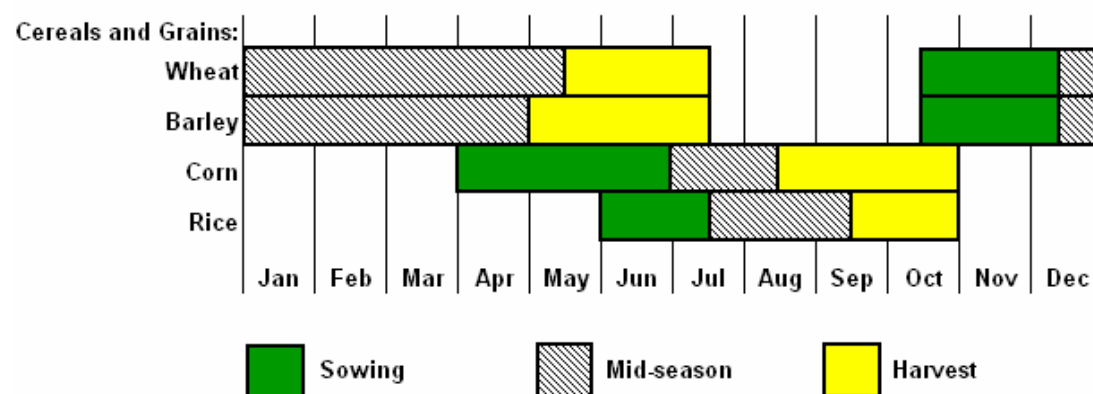
Figure 31. NOAA Climate Prediction Center 7-day precipitation forecast.

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APPENDIX

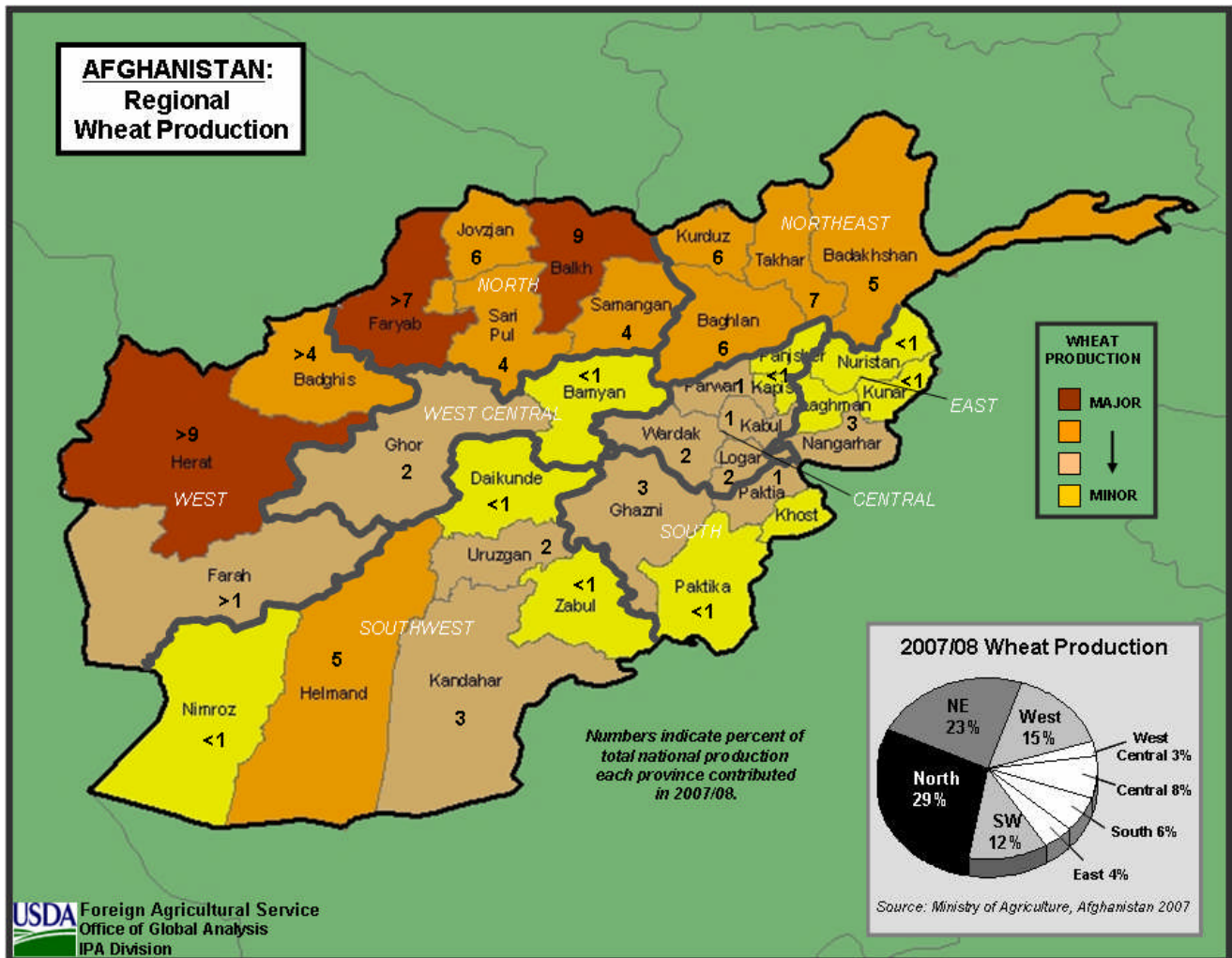
Afghanistan Crop Calendar



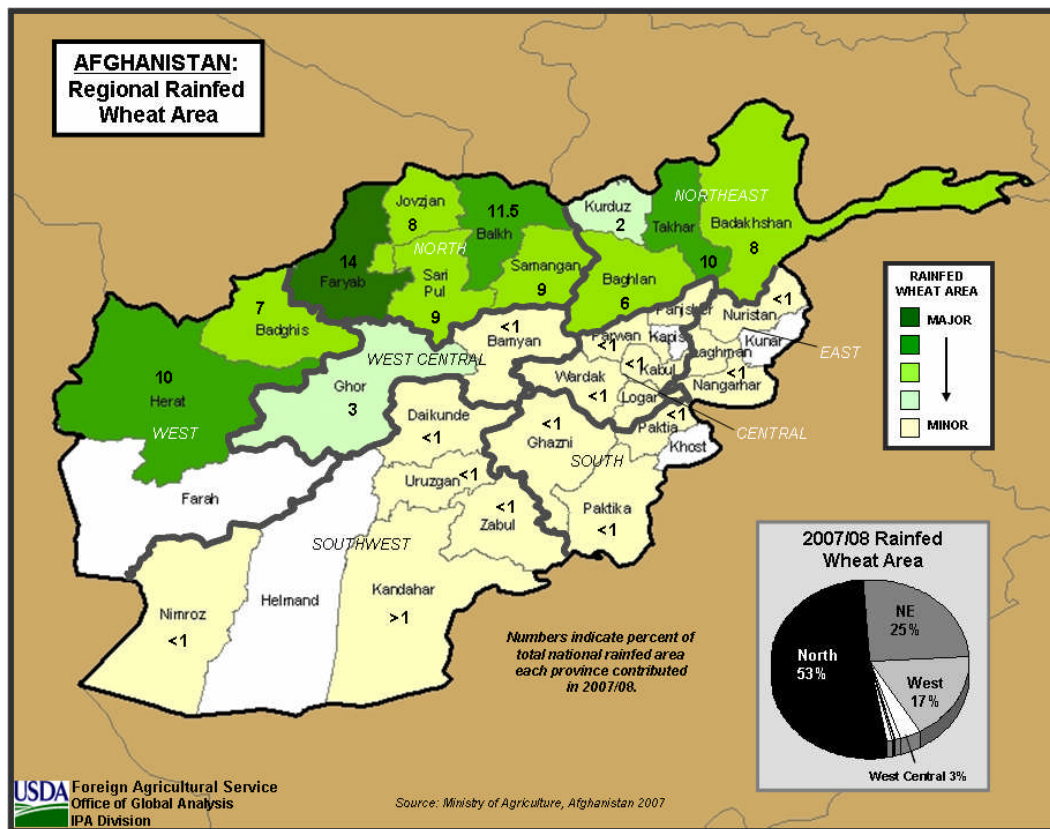
* Calendar represents major production regions. Earlier planting expected in the central highlands.

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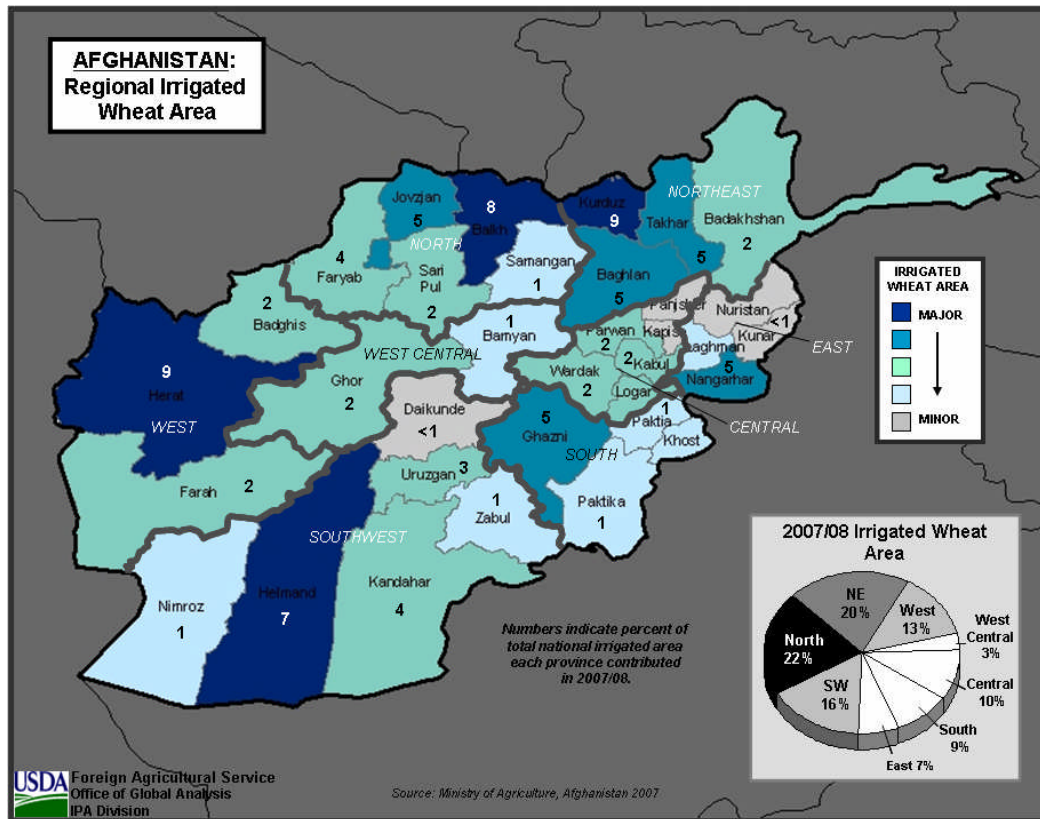
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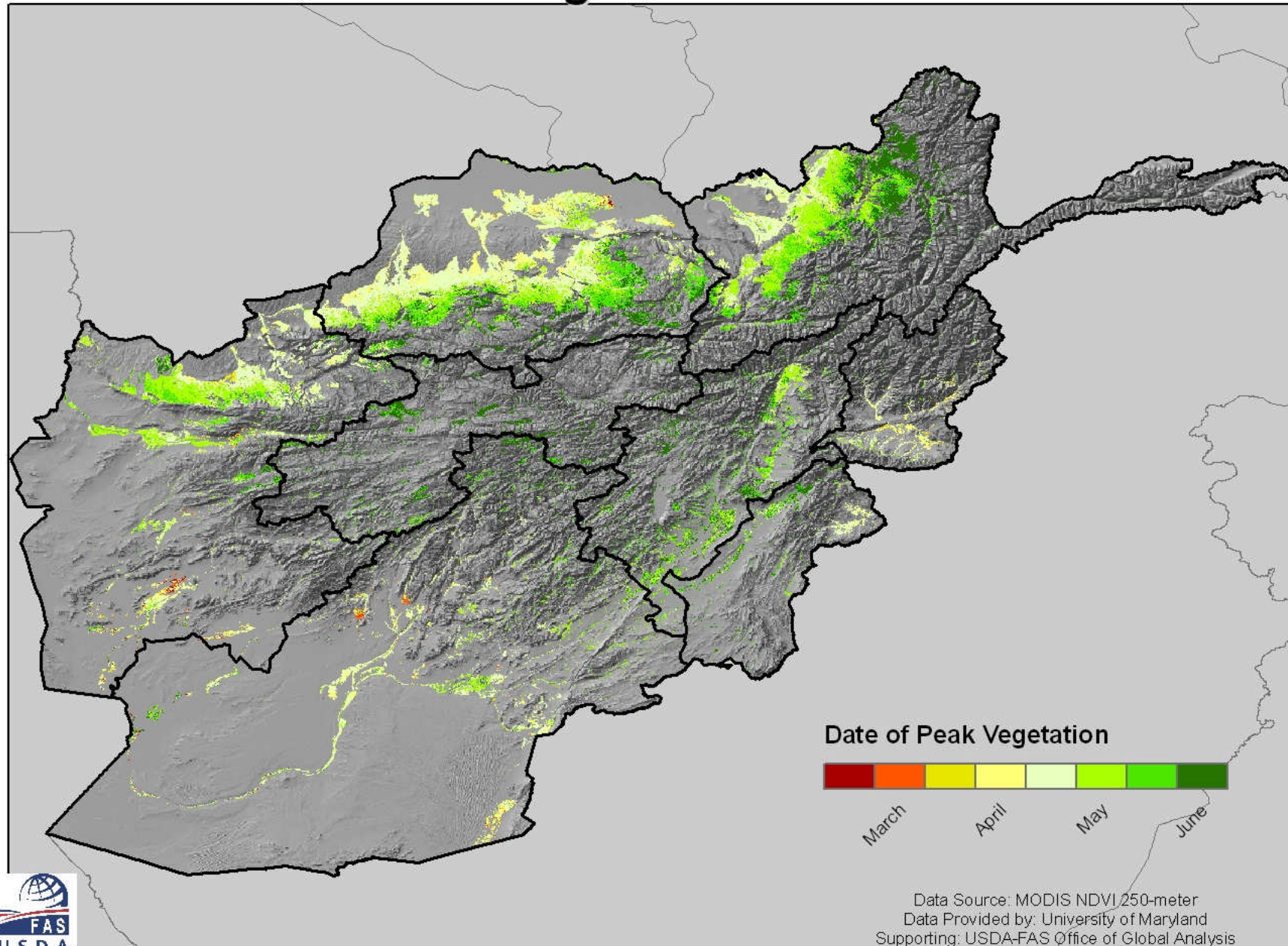
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Date of Peak Vegetation - Winter Grains



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